THE IRON TRADE REVIEW

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BETTER FEELING

FOLLOWS NEW YORK MEETING OF PIG IRON SELLERS.

Large Purchase of Basic Pig and Some Important Inquiries Pending.—Heavy Shipments of Iron Ore During the Year.

The effects of the last New York meeting of pig iron and ore interests have been favorable. The action in removing all obligation to maintain prices by those interests which have been acting in harmony and taking very few orders has been followed by a lowering of quotations by the companies which had been asking the highest prices, and there is now a general feeling that bottom prices have been reached. This conviction is strengthened by the firm attitude of ore interests in declining to recede from their position or make any concession to buyers of ore. While the price maintenance movement, so far as pig iron is concerned, has been formally abandoned, it is felt that much has been accomplished through the prevention of ruinous price cutting during the earlier period of the depression, and as to finished materials, there is no reason for believing that there will be a general revision of prices at any time in the near future.

Pig Iron Conditions

There is more life in the pig iron market than for many weeks. While some leading southern interests which had been holding for $13 Birmingham for No. 2 have lowered their quotations, it is understood that offers of large tonnages at $11.50 Birmingham have been refused, although some sales are still being made at that figure for prompt shipment. In eastern markets, prices have been readjusted, but quotations lower than those recently made by some sellers are seldom heard. Cast iron pipe interests are inquiring for large tonnages, and a sale of 10,000 tons of basic pig iron has been made to a steel foundry interest.

Ferro Market Firmer

English manufacturers of ferro - manganese have apparently sold all the tonnage they cared to dispose of at recent low prices, and have raised their quotations. While small lots are selling at $43, sellers are, as a rule, not willing to dispose of large tonnages for advance shipment at less than $45, and some are holding for as high as $46.50 Baltimore.

Iron Ore Statistics

Iron ore shipments from Lake Erie ports to furnaces for the year ending May 1, made a new record, totaling 31,692,446 tons, an increase of more than a million and a half tons over the previous high record, that for the year ending May 1, 1907. Ore on docks May 1 amounted to five million and a half tons, which is also a new record. The unknown factor in the situation is the ore in furnace yards, for which statistics are not available, but it is believed that that tonnage exceeds the ore on docks.

Structural Material

The principal contracts for structural material placed during the past week were for the LaSalle hotel, Chicago, 7,000 tons, and 3,500 tons for the first section of the New York Central freight terminal. Other important contracts pending are a drainage canal bridge, Chicago, 4,200 tons; court house at Duluth, 1,500 tons; and the new state building at Albany, 12,000 tons. An extensive enterprise for supplying water to the city of Los Angeles, Cal., and involving an expenditure of $23,000,000, will call for a large tonnage of pipe, steel plates and reinforced bars, for which the contract is to be let Aug. 1.

Firmer Prices

Other sellers of billets show no disposition to follow the example of the Buffalo concern which sold at about $3 below the prevailing quotation, and there is increased firmness in maintaining prices on crude steel and finished material. In some cases, buyers who had deferred placing orders in the hope that lower prices would prevail have made contracts.

AGGRESSIVE WORK

Against Dangerous Bills Advocated by Judge Speer.

Boston, May 6.—At the monthly meeting and dinner of the Boston branch of the National Metal Trades Association tonight, President Edwin E. Bartlett presiding, the principal after dinner speaker was Judge William H. Speer, of Jersey City. Other speakers were H. J. Burroughs and Henry D. Sharpe, of Providence, J. H. Cone, assistant secretary of the National Metal Trades Association, George Lawley and Edward P. Robinson.

Judge Speer's address was a practical talk on the relation of public opinion to law-making. He alluded to the defeat by the Massachusetts senate today of the peaceful picketing bill, so-called, to the attempts made in congress to pass labor measures advocated by President Gompers, of the American Federation of Labor, and to the proposed regulation of injunction proceedings by the courts, and counseled active and aggressive efforts by organized business men to counteract the influences of an un-American character that are brought to bear upon legislators. It was the duty, he said, of the members of such organizations as this to create public opinion and to see that laws are not enacted merely in response to the clamor of self-constituted leaders.

THE WEEK IN IRON CENTERS

PITTSBURG.

Firmness of Ore Sellers Has a Steadying Effect on the Market.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., May 12.

With increased indications and assurances that no price concessions in ore may be expected, a more settled tone is working through the pig iron market and sentiment appears to have begun to improve. Some consumers, in the belief that bottom prices are in sight, are coming into the market a little more confidently and several selling interests report having more inquiry at hand than at any time during the present depression.

The meeting of pig iron makers in New York last week, by its expression of belief that ore prices would not be lowered, has undoubtedly played a part in spreading a more secure feeling among buyers as to the present market. With ore prices firmly upheld, the opinion is quite freely expressed that the strength of the iron market in turn devolves upon the southern makers. If no severe reductions of present prices in that section are made, it is believed that the groundwork will then have been laid for more stability in the entire pig iron market. The return of a fair measure of steadiness to pig iron is expected to lend a good influence to other lines.

Beyond the better defined conditions in pig iron, there is practically no change in the general iron and steel situation. Reluctance to buy for the future is general among buyers, with the possible exception as to tin plate where the season's influence is offsetting any disbelief as to the firmness of present prices. The approach of the second half of the year, bringing with it the expiration of many contracts, is a factor that may apply itself to a change of present sentiment among buyers.

However, steel makers express little expectation of improvement before presidential candidates and platforms shall have been selected and the probable result of the campaign foreseen. It is said that no buying of consequence by the railroads may be looked for before the political factor in the situation shall have been eliminated. The present attitude may be regarded as one of simply waiting.

More immediate interest is being shown as to the amount of ore to be brought down by lake from the Superior ranges this season. Some of the larger companies are inquiring of their affiliated interests as to some estimates of their probable needs, so that arrangements may be made for the mining and transportation operations.

Pig Iron.—The conviction that pig iron prices, especially as to the foundry brands, are close to the bottom point appears to be spreading among consumers and more inquiry is in evidence. By this much there is a better feeling and prices appear firmer at the present level. The foundry iron market is quoted at from $14.50 to $14.75 valley, the latter price being commanded by the higher silicon irons, although the price differentials between grades usually maintained are being disregarded. Inquiries for more than 5,000 tons of foundry iron have come out within the past week, the major portion of which is expected to be placed soon. This includes 1,200 tons of Nos. 2 and 3 and gray forge for immediate delivery for a cast iron pipe interest in northern Ohio. Another northern Ohio melter, a heating and ventilating appliance manufacturer, is in the market for 1,000 tons of northern and 1,000 tons of southern iron, for last half delivery. The inquiry from the Pittsburg district remains light.

The market in Bessemer iron is dull and we quote sand cast at from $16 to $16.50 valley furnace, the former price for prompt shipment. Some increase in the interest in malleable has developed and inquiries aggregating about 1,000 tons are out. The market ranges from $15.25 to $15.50, at which we note the sale of several small tonnages, lower prices having been named, principally by brokers.

Basic is not as strong at $15.50 valley as it has been, but appears to be well settled around $15.25 valley. The largest single development in the basic situation, recently, is the opening of preliminary negotiations by the Pittsburg Steel Co. for obtaining its yearly supply of pig material aggregating between 100,000 and 150,000 tons. The company's present contract for open-hearth billets with the Carnegie Steel Co. will expire July 1 and when its new open-hearth plant at Monessen, Pa., is completed some time during the latter part of the summer, it will become an active consumer of basic pig iron and old material. The company will likely extend its billet contract several months pending the completion of its steel furnaces. The company has not come formally into the market by inquiry, as yet, but has been conferring with furnace interests.

Stocks of Bessemer and basic in the valleys were unchanged in the week. The list of active furnaces will be increased this week by the addition of the stack of the Struthers Furnace Co. which will go in on basic.

With the elimination of the possibility of a $10 basis, there is a somewhat livelier demand for southern iron and small sales are being made at from $11.50 to $11.75 Birmingham.

On prompt and second quarter delivery on northern iron, we quote as follows:

Bessemer, valley	$16.00 to 17.00
Bessemer, Pittsburg	16.90 to 17.90
No. 1 foundry, Pittsburg	15.65 to 16.15
No. 2 foundry, Pittsburg	15.40 to 15.65
Gray forge, Pittsburg	14.90 to 15.15
Basic, valley	15.25 to 15.50
Basic, Pittsburg	16.15 to 16.40

Ferro-Manganese.—The feature of the ferro-alloy market is the low price of ferro-silicon, which is now being quoted openly at $67 Pittsburg for forward deliveries. This is $22 under the previous low mark touched by this product about three years ago. The ferro-manganese market is steady at prevailing quotations. The low prices are attracting some buying for the future, and we note the sale of 900 tons for delivery in this district over the remainder of the year at about $44.75 Pittsburg, or $42.80 Baltimore, especially favorable conditions as to payment being involved. There is a fair inquiry. For prompt and future shipment we quote 80 per cent ferro-manganese at from $45 to $45.50 Pittsburg.

Imported 50 per cent ferro-silicon is quoted $67 Pittsburg on forward deliveries; domestic 12 per cent, $29; 11 per cent, $28; 10 per cent, $27. The lower grades of imported ferro-silicon are upon about the same basis. These quotations are applicable to Pittsburg territory.

Plates.—There is no improvement in plates and the comparatively light operation of mills at present is based upon specifications against contracts and on small order business for quick shipment. Little consumption for lake boat purposes is in prospect, the activity in this line being confined to necessary repairs. The steel car situation shows no improvement. Several small mills are quoting 1.60c on light gage plates. We quote:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.70c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds. Boil-

er and flange steel plates, 0.10c; A. B. M. A. and ordinary fire-box steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive fire-box steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Some improvement in black sheets for immediate delivery is noted, but the galvanized grade continues the most active. The general movement of sheets is, however, practically unchanged, and the activity of the mills has not been increased. Schedule prices on some sizes are being shaded by small independents. We quote:

Black steel sheets, one pass, cold rolled: Nos. 11-12, 2.10c; Nos. 13-14, 2.15c; Nos. 15-16, 2.20c; Nos. 17-21, 2.25c; Nos. 22-24, 2.30c; Nos. 25-26, 2.35c; No. 27, 2.40c; No. 28, 2.50c; No. 29, 2.60c; No. 30, 2.70c. Galvanized: Nos. 10-11, 2.45c; Nos. 12-14, 2.55c; Nos. 15-16, 2.65c; Nos. 17-21, 2.80c; Nos. 22-24, 2.95c; Nos. 25-26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.70c; No. 30, 3.95c. Blue annealed: Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation, and $3.10 per square on galvanized roofing, 2½-inch corrugation, No. 28.

Tin Plate.—The tin plate market continues the most consistently active of the whole iron and steel industry. Both the leading interest and independents are operating practically at full capacities with good prospects for continuing upon this scale. We quote:

Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—Enough tonnage on specifications, by scattering new orders by export trade, is being taken by the local maker, to keep the mills running at less than 50 per cent of normal capacity. Mill No. 3 of the Edgar Thomson Works, which has been rolling standards, is idle this week, but mills 1 and 2 are in operation. Light rail tonnage taken in the week amounted to about 1,500 tons. Low prices continue to be named on light rails, principally by rolling mills. Contracts being placed on standard railroad spikes are few, and buying is for immediate needs. The Big Four took about 1,000 kegs this week. On present specifications on Bessemer rails, we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $36; 12-pound, $32; 16-pound, $30; 20-pound, $29; 25 to 45-pound, $28; angle splice bars for standard sections, $1.65; standard spikes, $1.70 to $1.80 Pittsburg; hand spikes, $1.80 to $1.90 Pittsburg.

Steel.—Beyond a little better demand for forging billets, the market continues practically lifeless. Interest of makers in the week has centered upon the sale of 2,000 tons of open-hearth billets in this district at about $3 under the official figures, which was reported in last week's review. It is understood that the New York concern which sold the steel to the Page Woven Wire Fence Co. for Monessen, Pa., delivery, has a quantity of basic pig and scrap in its yard which it wishes to dispose of and believed it could do this more readily in the form of billets. As the company has only a limited amount of this material on hand, its willingness to undersell the market can only have a temporary effect, as the billet makers in general are holding firmly to the prevailing price of $28 Pittsburg, subject to the official division of the freight charge. Sheet and tin bars continue to be taken actively by the sheet and tin plate mills, and the plants of makers are operating at a high percentage of capacity.

We continue to quote Bessemer and open-hearth billets $28 Pittsburg, and forging billets at $30 Pittsburg, subject to the division of the freight charge over $1 and not exceeding $3, and sheet and tin bars at $29.50 Pittsburg, valley and Wheeling territory, and $29 Pittsburg for delivery to other points.

Hoops, Bands and Cotton Ties.—The movement of cotton ties at present is from warehouses in the south to jobbers and consumers. One of the principal cotton tie makers will make an additional shipment to its warehouses within the next several weks. Hoops show no more strength, and are quiet. There is no change in the band situation. We continue to quote the following official prices:

Cotton ties, 85c per bundle Pittsburg, plus the freight on lots of 3,000 bundles or more, and 88c per bundle Pittsburg for less than 3,000 bundle lots.

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Merchant Bars.—Reports of shading of soft steel bar prices are current, but these cannot be verified. The same spirit, as in the past, is dominating the steel bar trade, consumers specifying or buying only for actual wants. Jobbers who hold bar iron contracts at 1.40c, taken before the recent rise to 1.50c, have been taking some business from the mills by quoting 1.45c. The mills in general, however, appear to be faithfully observing the 1.50c basis. Rerollers are quoting low prices on steel specialties, and are getting a good portion of the business. We quote:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.60c in less than carloads; 1.47c to 1.50c base Pittsburg plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c; plow and cultivator, 1.60c; channels, angles, zees, tees, under 3 inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 56 per cent in carloads, and 52 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1½ by 1½ inches, 1.75c; iron finished tire, 1½ by 1½ inches and over, 1.60c base. All tire subject to ½ extra on the steel card.

On cold rolled strip steel, widths 1½ inch and wider and 0.100 inch and thicker, we quote base prices per 100 pounds, $3.60 on hard and $3.75 on soft.

Structural Material.—Estimating departments of erecting companies are quite busy generally, upon small-sized work but contracts being placed are still very few. Although prices are low due to the close competition of fabricators, and other material is obtainable at reduced cost, financial difficulties are restraining the completion of many building projects. The activity of the mills of steel makers is being maintained at less than 50 per cent of normal, principally by small order business. Bids were taken this week in the name of the Iron City Improvement Co. for 1,200 tons for an addition to the Fort Pitt Hotel, Pittsburg. The Renshaw building in this city, for which a general contract has been awarded, will require about 600 tons to be furnished by the Jones & Laughlin Steel Co. Railroad work is still at a minimum, being confined wholly to necessary improvements. The inquiry for 5,000 tons for a bridge over the Kentucky river for the Chicago, New Orleans & Texas Pacific railway has come out, and bids on the steel will be received Friday of this week. Steel prices are firm and we quote:

Beams and channels, 15-inch and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.70c base.

Merchant Pipe.—A number of good sized oil and gas line projects, including one which will require upwards of 100 miles of 12-inch pipe, are under financing, and are expected to develop within the next two or three months. In merchant pipe, a healthy trade is continuing and mills are operating at from 40 to 50 per cent of normal with fairly good prospects. Galvanized pipe is moderately active by reason of the influence of the season. Stocks in jobbers' hands are low, and the output of the mills, in the main, is going directly into consumption. The increased cost of production under the curtailed operations is putting price reduction out of question, in the opinion of manufacturers, and official quotations in both iron and steel pipe are being closely observed. We continue to quote the following official discounts to consumers in carload lots, with an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	65	49	63	..
⅜ inch	67	53	65	51
½ inch	69	57	67	55
¾ to 6 inches.....	73	63	71	61
7 to 12 inches.....	70	55	68	53
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	58	46	56	44
½ to 4 inches.....	65	53	63	51
4½ to 8 inches.....	61	49	59	47
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inches.....	54	43	52	41

Boiler Tubes.—The trade in boiler tubes is moving along quietly, and, outside of exceptional cases, prices are firm. Railroad buying is light. We continue to quote the following discounts:

	Iron.	Steel.
1 to 1½ inch.....	42	47
1¾ to 2¼ inch.....	42	59
2½ inch	47	61
2¾ to 5 inch.....	52	65
6 to 13 inch.....	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Wire Products.—The encouraging feature about the wire situation is the absence of stocks of material with jobbers or of finished goods in the hands of manufacturers. The product of the mills is going almost directly into use. The careful manner in which buying is being done by the trade, is continuing to prolong the spring activity in wire products. Prices are unchanged and we quote:

Wire nails, jobbers' carload lots, $2.05; retailers' carload lots, $2.10; less than carloads, $2.15; painted barb wire, $2.20 for jobbers in carloads; retailers in carloads, $2.25; and less than carloads, $2.35, with 30c for galvanizing; plain wire, 1.90c for jobbers, and 1.95c by carload.

Wire Rods.—Small quantity purchasing with an occasional larger contract and specifications against contracts represent the wire rod market. We quote $35 Pittsburg on Bessemer and $36 Pittsburg on open-hearth rods.

Coke.—The coke situation is undergoing a slight improvement in both foundry and furnace grades, as far as demand is concerned, but there is no betterment in prices or operations. The larger tonnage moving is on increased specifications and small order business. A sanitary manufacturing company is in the market for its requirements of foundry coke from June to June, aggregating about 10,000 tons and to be delivered in Pittsburg territory. Some furnace business is under negotiation. We quote standard Connellsville foundry coke at from $2 to $2.25 ovens according to the tonnage and the delivery. Other grades are going at lower prices. Standard Connellsville furnace coke is quoted from $1.65 to $1.75 ovens, but lower prices have been done in this and other grades, according to the circumstances involved. Some interests rather than accept less than $2.25 for their foundry coke, prefer to ship it as furnace coke, over which the regulations as to acceptance and transportation are not so severe. By private sources it is estimated that the production in the Connellsville region last week was about 27 per cent of normal. The H. C. Frick Coke Co. put in 700 ovens this week and next week's output will be larger. The *Courier's* compilation for the week of April 25 to May 2 shows 14,065 active ovens and a production of 166,175 tons against 14,231 ovens and 164,858 the preceding week.

Old Material.—Few carloads and small tonnage sales constitute the only buying activity in old material at present. Consumers are taking advantage of the declining market and are closing only for their actual requirements. The Pennsylvania lines west sold 3,000 tons this week and the Pennsylvania lines east have issued a large list made up of about 27,000 tons of which about 20,000 tons is roadway scrap. Not all the latter tonnage is expected to be placed, however. While the market is altogether nominal, some grades show declines and we quote as follows:

Heavy melting scrap, $12.50 to $13; re-rolling rails, $14 to $14.25; bundled sheet scrap, $8.50 to $9; iron axles, $18.50 to $19.50; old iron rails, $15 to $16; No. 1 wrought scrap, $13.25 to $13.75; old car wheels, $13 to $13.50; low phosphorus scrap, $15.50 to $16; machine shop turnings, $8 to $8.50; cast borings, $7.25 to $7.75; No. 1 cast scrap, $14 to $14.50.

CHICAGO.

Increased Interest in Pig Iron—Important Structural Contracts.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, May 12.

Chief interest in the market is centered about the pig iron situation where the question of prices in the southern territory is rapidly approaching a generally recognized critical point. The price of southern iron has declined to $11.50, that figure being quoted also by one large company which up to this time has held at $13. Inquiries for tonnages, both large and small, are numerous in a serious attempt to determine as far as possible the probable trend of prices. This inquiry, despite the relatively small tonnage placed, following it, has added life to the market which up to this time has been entirely lacking. Of leading importance in connection with structural materials was the placing of the contract for the La Salle hotel, which involves about 7,000 tons and which has been delayed for many weeks. It would seem to be a very decided indication that the contractor had come to believe that there would be no reduction in the price of structurals, unless he is being protected in some way. It has been understood that the delay in letting the contract was entirely in anticipation of a possible reduction. Of smaller contracts which are about to be closed, there is reported about 8,500 tons. The rail situation seems to be somewhat brighter for the week, locally. The high tee rails sold by the Pennsylvania Steel Co. in Milwaukee are to be of open-hearth steel and brought a premium of $2 a ton. The scrap market bids fair to develop still greater weakness and lower prices are anticipated.

Pig Iron.—Interest in the pig iron situation has been awakened to a very considerable degree. Consumers of iron are becoming impressed apparently with the fact that the price of southern iron is hovering pretty close to the bottom and, while it may go 50 cents or a dollar lower, it has reached a point where opportunities to buy fair tonnages at a little below the nominal market are not to be passed up carelessly. Southern iron has declined to a uniform level of $11.50 for No. 2 Birmingham. Occasionally a better price than that can

be obtained by the furnace for small lots or where special conditions obtain. On the other hand, advantages in freight to delivery points are undoubtedly being used by such interests as possess them, from which circumstances arise reports of $11 Birmingham. Much of the rumor of $11 for No. 2 doubtless emanates because of the extent to which expressions from purchasers that offers have been made are circulated, but there is no available evidence that actual transactions have been made at that price. In fact, it is known that offers of desirable tonnage have been turned down. The northern situation is unchanged. The total tonnage of malleable Bessemer purchased by the International Harvester Co. amounts with the final purchase of 500 tons to 2,500 tons. The American Steel Foundries purchased low phosphorus iron for one of its eastern plants, the tonnage placed being reported as 2,000 tons. An inquiry by the same interest for basic iron for its East St. Louis plant, it is understod, has been filled. The inquiry has been presented in various forms, the largest tonnage running to 10,000 tons. The general run of foundry irons sold was in lots of a few hundred tons, among which was some Lake Superior charcoal. We have revised our prices and quote as follows:

Lake Superior Charcoal	$20.00 to 20.50
Northern Foundry No. 1	17.50 to 18.00
Northern Foundry No. 2	17.00 to 17.50
Northern Foundry No. 3	16.50 to 17.00
Southern Foundry No. 1	16.35 to 16.85
Southern Foundry No. 2	15.85
Southern Foundry No. 3	15.85 to 16.35
Southern Foundry No. 4	15.35 to 15.85
Southern No. 1 Soft	16.35 to 16.85
Southern No. 2 Soft	15.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Southern Silveries, 4 per cent Silicon	17.85 to 18.35
Southern Silveries, 5 per cent Silicon	18.35 to 18.85
Southern Silveries, 6 per cent Silicon	19.35 to 19.85
Jackson Co. Silveries, 6 per cent	18.90 to 19.40
Jackson Co. Silveries, 8 per cent	20.90 to 21.40
Jackson Co. Silveries, 10 per cent	22.90 to 23.40
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.25 to 18.75
Alabama Basic	17.35 to 17.85

Billets and Rods.—An occasional inquiry for a few billets is the extent to which this product is a factor in the market. The movement of wire rods is confined to shipments on contract and this is in small volume. We quote for Chicago delivery, rolling billets, $29.50; forging billets, $31.50. Wire rods continue at $35 for Bessemer, $36 for open-hearth, and for chain rods $37, all f. o. b. Pittsburg.

Merchant Bars.—Despite a quiet situation in bar iron in this market, the mills at Chicago are holding the price of bars at $1.65 Chicago. Such offers as have been reported from outside mills, where departures from this position appear, are apparently not of a character to affect the attitude of the local mills. The market position of steel bars is not so strong and there is a very limited movement. The month of April, however, brought out a much better tonnage of steel bars than did March. We quote as follows:

Bar iron, 1.65c to 1.68c; soft steel bars and bands, 1.78c, half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base tire card; iron finish, 1½ x ½ inch and larger, 1.78c base, steel card; channel for solid rubber tire, ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 1.93c; cutter shoe, 2.36⅛c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 56 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.10c, full extras; soft steel bars, $2 per 100 pounds base, plus half extras; soft steel hoops, 2.40c; full extras.

Plates.—The sheared plate mill at the South Works of the Illinois Steel Co. is operating this week. There has been no improvement in the plate situation. All of the orders received are for prompt shipments and as a result a large part of the busines from this territory placed during the weeks when the local mill of the leading interest is down is transferred to Pittsburg. We quote:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.88c to 1.91c Chicago. For extras see Pittsburg report. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 2.10c to 2.20c; from 72 to 96 inches wide, 2.20c to 2.30c; 3/16 inch up to and including 60 inches wide, 2.20c to 2.25c; 72 inches wide, 2.45c to 2.55c. No. 8, up to 60 inches wide, 2.20c to 2.25c. Flange and head quality, 25c extra.

Sheets.—With perhaps one or two exceptions, the activity in sheets in this market has dwindled perceptibly both as regards the orders to the mills and buying from store. This is something of a disappointment in view of the encouraging character and volume of business placed a short time ago. Prices are being maintained uniformly and our quotations are for delivery from store. For mill prices see Pittsburg report:

No. 10, 2.20c to 2.25c; No. 12, 2.25c to 2.30c; No. 14, 2.30c to 2.35c; No. 16, 2.40c to 2.50c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c. Galvanized sheets, Nos. 10 to 16, 3.05c to 3.15c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4.00c; No. 30, 4.40c to 4.50c.

Structural Steel.—Bids are now out on several undertakings the contracts for which will be placed in a few days. The Illinois Central railroad will build a bridge over the tracks of the Nickel Plate south of Chicago and the Monon is in the market for 400 tons of bridge structurals. The Chicago, Burlington & Quincy will let a contract for 200 tons of bridge structurals this week. The sanitary district, in erecting a bridge over the drainage canal near Chicago, built it a three hinged arch with a view to changing it subsequently into a rolling lift. This change will now be made and bids have been submitted. The structure consists of three separate parallel double track bridges and the changes will require 4,200 tons of steel of which 2,300 tons will be steel structurals. The contract for the St. Louis county court house at Duluth will also be let in a few days, the tonnage being about 1,500. The Tacoma postoffice building, for which 528 tons of steel will be needed, was let to Wm. H. Maxwell, general contractor, of Spokane. The absence of other business in the west has directed interest toward the project of the aqueduct commission for supplying water to the city of Los Angeles, Cal. Already over $1,000,000 has been spent in acquiring property along the route of the proposed aqueduct and it is estimated that an additional $22,000,000 will be required for the completion of the undertaking, the money for which has already been provided. The project involves the building of this water route 220 miles from Independencia, up near the Nevada state line, down to San Fernandina, where connection will be made with the present water system. The aqueduct will be of concrete and it is understood that the contract for reinforcing bars will be let Aug. 1. In addition, there will be required about 10 miles of siphon pipe 9 feet 6 inches in diameter and built of steel plate and 10 miles of bridges, 9 feet deep and 12

feet wide, to be built, according to present plans, of steel. We quote:

Beams and channels, 3 to 15 inches inclusive, 1.88c to 1.91c delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles, over 6 inches, $2.15 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2.05 per 100 pounds, base; channels, 3 inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The week brought indication of a slight improvement in the status of at least two railroads under contract for rails with the local mill of the Steel Corporation and two specifications each for 2,000 tons, which had been withheld previously because of financial reasons, were received in consecutive days. The leading interest also sold 1,000 tons to the Monon road and in addition an aggregate of 500 tons. The Pennsylvania Steel Co. sold 1,500 tons of high tee rails to the Milwaukee Electric Light & Railway Co. operating the Milwaukee railways. The Chicago City Railways is in the market for about 200 tons of rails. The balance of the New York Central line's requirements of track fastenings has not yet been received. It is reported that the mills at Joliet are running up to 90 per cent of their capacity. We quote:

Standard rails, $28 f. o. b. mill, full freight to destination; light rails, 25-pound to 45-pound, $28; 20-pound, $29; 16-pound, $30; 12-pound, $31. Track supplies, f. o. b. Joliet, angle bars, 1.50c in carload lots; spikes, 1.80c to 1.90c; track bolts, with square nuts, 2.30c to 2.40c; with hexagon nuts, 2.45c to 2.50c. Small railroad and square boat spikes, 1.90c base, f. o. b. Pittsburg.

Merchant Pipe and Boiler Tubes.—While there is no diminution in the small demand for tubular material, the routine movement is featureless. As the agricultural prospects become more established, there is reason to hope for increasing volume of business.

We quote mill discounts, Chicago delivery, carload lots, as below. On steel pipe jobbers are allowed a concession of one point and 5 per cent additional from the schedule in force.

	—Steel— Black.	Galv.
¾ to 6 inches, inclusive....	71.2	61.2

BOILER TUBES,

	Steel.	Iron.	Seamless.
2¼ to 5 ins., inclusive..	63.2	50.2	49.2

Mill quotations on iron pipe are five points higher than the foregoing prices.

We quote prices from store unchanged, as below. A concession of one-half to one point from these prices is allowed by Chicago jobbers on carload orders shipped from local stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch.....	64	48
⅜ inch	66	52
½ inch	68	56
¾ to 6 inches.....	71	62
7 to 12 inches.....	68	53

Store prices for wrought iron pipe, carload lots, from Chicago stocks, are as follows: One-eighth to ¼ inch, 59; ⅜-inch, 61; ½-inch, 63; ¾ inch to 6 inches, 68; 7 inches to 12 inches, 65. Boiler tubes from store are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	35	35	35
1¾ to 2¼ inches.....	50	35	35
2½ inches	52½	35	35
2¾ to 5 inches.....	60	47½	47½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—The largest letting of cast iron pipe noted for some weeks will take place at Detroit next week, when the contract for 6,500 tons will be placed. The previous contract placed by this city earlier in the year went to the Detroit shop of the American Car & Foundry Co. There is also to be a letting at Dayton, O., and the contract for the 400 tons at Milan, Mich., is still to be placed. The waterworks convention will be held at Washington next week. We quote: 4 to 6-inch pipe, $27; 6 to 16-inch, $26; larger sizes, $25; gas pipe, $1 a ton higher.

Wire Products.—Although it is probable that the greatest activity in wire products is past so far as the spring trade is concerned, it is reported that the present volume of business is within a very few per cent of that of a year ago. A better feeling prevails regarding the extent to which this business will fall off in the next few months and it is believed that the establishing of prices on a basis that will lend assurance to the buyer in this and other products is probable. We quote:

Wire nails, $2.23; painted barb wire, $2.38; galvanized barb wire, $2.68; smooth annealed wire, $2.08; smooth galvanized wire, $2.38; polished staples, $2.23; galvanized staples, $2.63. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—A larger tonnage of coke has been sold in this market in the last fortnight, although actual operations where coke is consumed seem to be unchanged in activity. The somewhat firmer feeling is not reflected in prices and we quote standard Connellsville coke at $2.00 to $2.25 and furnace coke at $1.60 to $1.75 at the oven. On large tonnages of furnace coke it is probable better prices would prevail.

Old Material.—Indications point to greater weakness in the scrap market. The small movement of material to consumers has been outdistanced by the quantity of old material bought for storage by the dealers. It would appear that the strong position occupied by re-rolling rails has reached a maximum although there is still a limited demand and one mill is known to be willing to buy a fair tonnage within the range of prices quoted below. About 6,500 tons of scrap was listed by the railroads, of which the Southern Railway Co. offers 3,300 tons, including 740 tons of steel rails and in addition 400 old car wheels. The St. Paul has a list of 3,000 tons, of which about 700 tons are iron and steel rails. The Chicago & Alton has a small list of 300 tons. We have revised our prices and quote as follows:

Old car wheels	12.50 to 13.00
Old iron rails	14.75 to 15.25
Re-rolling rails (3 ft. and over)...	13.00 to 13.25
Old steel rails (3 ft. and under)	12.00 to 12.50
Light section relayers, 45 lbs. and under, subject to inspection....	**21.00 to 23.00**
Relaying rails, subject to inspection	**19.00 to 19.50**
Frogs, switches and guards.....	**11.50 to 12.00**
Heavy melting steel.....	**11.00 to 11.50**

We quote, net tons, as follows:

No. 1 R. R. wrought.....	**$11.00 to 11.50**
No. 2 R. R. wrought.....	**10.00 to 10.50**
Knuckles, couplers and springs..	10.50 to 11.00
Shafting	**14.00 to 14.50**
Iron car axles	15.75 to 16.25
Steel car axles.....	**15.00 to 15.50**
Dealers' forge No. 1.....	**9.00 to 9.50**
Pipes and flues.....	**7.75 to 8.25**
No. 1 cast, 150 lbs. and less....	11.50 to 12.00
No. 1 mill.....	**6.75 to 7.25**
Mixed busheling (Nos. 1 and 2).	6.50 to 7.00
Country sheet	**5.25 to 5.75**
No. 1 boiler cut.....	**7.00 to 7.50**
Boiler punchings	**10.00 to 10.50**
Cast borings	4.00 to 4.50
Mixed borings, etc.....	4.00 to 4.50
Machine shop turnings	**6.00 to 6.50**
Railroad malleable	**10.00 to 10.50**
Agricultural malleable	**9.50 to 10.00**
Stove plate and light cast scrap..	9.75 to 10.25
Old iron splice bars.....	**13.00 to 13.50**

CLEVELAND.

No Interest in Iron Ore—Pig Iron Dull—Bottom Prices Reached.

Office of THE IRON TRADE REVIEW,
Browning Bldg., May 12.

Iron Ore.—The representative of an important selling interest who has returned from an extended trip to the east reports that he found absolutely no disposition on the part of furnace men to place orders for ore, and he is of the opinion that very little Lake Superior ore will be bought for use east of the Allegheny mountains this year.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer and 51½ per cent on old

range and Mesabi non-Bessemer, we quote, as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20, and Mesabi non-Bessemer, $4.

At a meeting today at which most of the important vessel interests were represented, it was decided to hold the big coarse freighters in port until June 1, at which time another meeting will be held, and the start may be further delayed. The present outlook is that there will be very little activity on the lakes prior to July 1. The statistics of ore on dock May 1 will be found elsewhere in this issue.

Pig Iron.—Following the New York meeting, at which it was decided to allow every seller to make his own prices, one large southern interest, which had been holding for $13, Birmingham, reduced its quotation to $12. Several other important interests are holding for $12, but are taking no orders, as smaller companies are selling freely at $11.50, and reports of lower quotations are current. Cast iron pipe interests are the only ones inquiring for any considerable tonnage. A Massillon company is in the market for a considerable tonnage, but no sales are reported. Very few sales of northern iron are being made, and the usual quotation is $14.50, valley, for No. 2, although some interests are holding for $15. One Cleveland interest has sold a fair tonnage at $14.85, furnace, for delivery outside of the city. Bottom prices have apparently been reached. For Cleveland delivery we quote as follows:

Bessemer	$16.90 to 17.25
No. 1 foundry	15.50 to 15.75
No. 2 foundry	15.25 to 15.50
No. 3 foundry	15.00 to 15.25
No. 2 southern	15.85 to 16.00
Gray forge	14.00 to 14.50
Lake Superior charcoal	20.00 to 21.00

Coke.—Some foundries are inquiring for coke for the year beginning July 1, but the market is very quiet on both furnace and foundry grades. For standard furnace coke, we quote $1.60 to $1.70 at the ovens, and for high grade foundry coke, $2 to $2.15.

Finished Material.—The Municipal Traction Co. has placed an order for 1,000 tons of rails with the Lorain Steel Co., and has also ordered 100 "pay-enter" cars. Very little new business of any description is developing. Bar iron is quiet, the only sales being at low prices by jobbers who purchased when the 1.40c price, Pittsburg, was in effect.

Old Material.—Little movement of material of any note is apparent, and the market shows further signs of weakening. Busheling material dropped 50 cents a ton. Following the heavy list of railroad material closed last week, half a dozen eastern railroads, including the New York Central, D. & L., and the Southern, are offering large quantities of material this week. Since the present market is not an absorbing one to any important extent, it is believed that this week's offerings will further depress prices. We quote, f. o. b. Cleveland, as follows:

Old iron rails	$14.50 to 15.00
Old steel rails (re-rolling)	12.50 to 13.00
Old steel rails (under 6 ft.)	12.00 to 12.50
Old car wheels	12.50 to 13.00
Old steel boiler plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Malleable iron (railroad)	12.00 to 12.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.00 to 11.50
Country mixed steel	10.00 to 10.50
Low phosphorus	13.00 to 13.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.50 to 12.00
No. 1 busheling	9.50 to 10.00
No. 1 machine cast	11.00 to 12.00
Iron axles	16.00 to 17.00
Axle turnings	7.00 to 7.50
Machine shop turnings	5.50 to 6.00
Grate bars	9.00 to 10.00
Pipes and flues	9.00 to 10.00
Tank iron	8.25 to 9.25
Hoop and band iron	5.25 to 6.25
Sheet iron	4.25 to 5.25
Wrought drillings	5.50 to 6.00
Stove plate	9.50 to 10.00
Cast borings	4.50 to 5.50

NEW YORK.

Readjustment of Pig Iron Prices Follows New York Meeting.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., May 12.

Pig Iron.—Following the gathering of iron ore and pig iron interests in this city last week and the issuing of a statement containing the information that "there is no agreement to maintain the price of pig iron," there has been considerable readjustment of quotations by producers. The basis of this has been the cost of manufacture. Those furnaces which have been quoting well under the official price in order to take current business are holding to practically the same level as before the meeting. Those interests which maintained the official schedule, and took little or no business, have very generally lowered their figures to about those at which sales have been made generally. So far, the discontinuance of the price understanding has had little effect other than to add to the number of furnaces willing to sell at the actual level of the past month or two and to increase the number of brands procurable at those figures. A few large producers, in fact, have decided not to reduce their quotations and will store such iron as they make rather than dispose of it at a loss. Inquiry is very much better than at any time this year. A New England consumer is in the market for 5,000 tons of malleable for second half shipment and there are a number of inquiries current for from 300 to 1,000 tons for delivery running through the year. The foundry melt seems to be increasing to a noticeable extent. Small sales closed late last week in the Philadelphia and New England districts total several thousand tons. Iron from the central west is competing for business in this territory at about $14.50, furnace, for No. 2 foundry and a sizable tonnage of No. 2 southern foundry is reported to have been placed at a little over $11, Birmingham, though it is not certain that this was a fair test of the market. Our quotations, for tidewater delivery at New York, have been revised, the higher figure being brought down to the actual level at which business is going. Heretofore the higher figure has represented the asking price of allied interests. We quote:

Northern foundry No. 1	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
No. 2 southern foundry	16.00 to 16.50
Malleable	17.00 to 17.50
Basic	16.75 to 17.25
Gray forge	16.50 to 17.00

Ferro-Manganese.—Current inquiry will aggregate perhaps 1,200 tons. Small lots are selling at $43 to $43.50, seaboard, with producers unwilling to grant concessions for large tonnages for advanced shipment.

Finished Materials.—There are indications that New York City's finances will be found sufficiently ample to allow the beginning of the Brooklyn Fourth avenue subway, bids on which were opened late last week. Eventually this work will call for about 40,000 tons of steel, but as this represents only about 1/10 of the total cost of the work, it is scarcely expected that the successful bidders for the general contracts will cover their requirements for some time. The American Bridge Co. has closed contracts with the New York Central for the 3,500 tons of steel needed for the first section of its freight terminal. The general contract for the South Ferry work in this city has gone to Snare & Triest at a bid very much lower than others submitted. About 2,300 tons of steel are involved. The D. L. & W. will need 4,000 or 5,000 tons for its new shops at Scranton, Pa., and 400 tons will be required for the new home of W. K. Vanderbilt on East Fifty-second street. It is expected that this week will see both the LaSalle hotel project (7,000 tons) and the Beaver bridge project (15,000 tons) definitely closed. The list of other pending work is steadily increasing. The United States Cast Iron Pipe &

Foundry Co. has taken 300 tons of pipe for Cuban account.

On bar iron 1.45c, New York, is being offered, and there is a little improvement in demand. Other finished and semi-finished lines manifest little change. We quote:

Angles, 3 to 6 inches x ¼-inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼-inch and heavier, 1.91c; plates, carloads, tanks, 1.86c; marine boilers, 2.26c; bar iron, 1.56c; soft steel bars, 1.76c; sheets, No. 28, black, 2.66c.

Old Materials.—Railway lists for May are generally very light. Shops have not been running actively and the variety of lines offered is not extensive. There is some inquiry for railroad wrought scrap and a few mills are asking for cast iron borings. Pipe is moving in a little better shape and limited sales of heavy melting steel are reported at full market prices. We quote, gross tons, New York delivery, as follows:

Old iron rails	$13.50 to 14.00
Old steel rails, re-rolling	14.00 to 14.50
Relaying rails	20.00 to 21.00
Old car wheels	13.00 to 13.50
Old iron car axles	16.50 to 17.00
Old steel car axles	15.50 to 16.00
Heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	13.00 to 13.50
Iron track scrap	11.50 to 12.00
Wrought pipe	9.00 to 9.50
Cast borings	5.00 to 5.50
Wrought turnings	7.50 to 8.00
Heavy cast scrap	13.00 to 13.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Stove plate	9.50 to 10.00
Grate bars	9.50 to 10.00

CINCINNATI.

Increase of Inquiry for Pig Iron, But Sales are Light.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., May 12.

In point of orders the market continues quiet and unchanged, but there is more inquiry and considerable shopping; all grades are included in the inquiries. One buyer asked for a price on 2,000 tons with deliveries extending into April of next year. There is an inquiry for 2,000 tons of malleable for prompt shipment and a 3,000-ton inquiry from a Michigan melter, one-half gray forge and one-half No. 1 soft. There is also considerable inquiry for basic iron. It is regarded as likely that the expectation of a decline in prices on the part of buyers has brought out considerable inquiry which would only result in business at lower levels than now prevail. The price situation remains on a quotable basis of $11.50 Birmingham for No. 2 foundry, but southern furnaces have recently made considerable iron with good silicon content and sales by analysis with silicon running 2 per cent and over have been made at No. 3 foundry price, which feature gives the market an easy appearance, as the buyer is made to feel that he is getting practically No. 2 foundry. The melt shows no material improvement. Most of the business is confined to small tonnages from a carload up to 200 tons. Northern irons are not much of a factor in this territory and seem to have reached a point where lower prices would be below the cost line and present quotations are too high to compete with the southern product. The recent sale of basic iron to an Ohio melter has developed the fact that quotations on basic are considerably lower than was generally believed in the trade. It is said that a price of $15.60 delivered, was made on this business, but the source of supply on which this quotation was based was not made public. Jackson county 8 per cent silicon remains quotable at $18.50 at furnace. We quote for prompt delivery and second quarter delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows.

	PER TON
Southern foundry No. 1	$15.25 to 15.75
Southern foundry No. 2	14.75 to 15.25
Southern foundry No. 3	14.25 to 14.75
Southern foundry No. 4	13.75 to 14.25
Southern No. 1 soft	15.25 to 15.75
Southern No. 2 soft	14.75 to 15.25
Southern gray forge	13.50 to 13.75
Northern No. 1 foundry	16.95 to 17.20
Northern No. 2 foundry	16.45 to 16.70
Northern No. 3 foundry	15.95 to 16.20
Northern 8 per cent silicon	19.70 to 20.20

Finished Material.—The market remains quiet and unchanged with mill orders light and business at the retail stores moderate. Jobbers' prices for filling small orders from stock are as follows:

Iron and steel bars, 1.85c to 2c, full extras. Angles, 3 x 3 and over, 2.10c to 2.25c; beams and channels, 15 inches and under, 2.10c to 2.25c; small angles and architectural channels, 2c base; plates, ¼-inch and heavier, 2c; 3/16 inch, 2.10c; No. 8, 2.15c; sheets (blue annealed) No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; box annealed sheets, Nos. 18 and 20, 2.55c to 2.65c; Nos. 22 and 24, 2.65c to 2.75c; Nos. 25 and 26, 2.70c to 2.80c; No. 27, 2.75c to 2.85c, and No. 28, 2.85c to 2.95c; boiler tubes, 2¼ to 5 inches, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3c base; cold rolled shafting, 47 to 50 per cent off list; steel tire, 2.05c to 2.10c base.

Coke.—While the market is not quotably changed, an easy tone prevails and business is dull. Spot coke is available at prices so much below contract quotations that buyers find no inducement to anticipate their wants and sales are mostly for prompt shipment to cover current needs. In some districts, there are plenty of cars loaded ready for shipping orders, so that prompt deliveries are readily obtainable. Quotations on spot coke are too irregular to offer. Contract prices in the leading coke producing districts are as follows:

	PER TON
Wise county furnace coke	$1.75 to 2.00
Wise county foundry coke	2.25 to 2.35
Pocahontas furnace coke	1.65 to 1.80
Pocahontas foundry coke	2.00 to 2.25
Connellsville furnace coke	1.65 to 1.75
Connellsville foundry coke	2.00 to 2.25

Old Material.—The market continues dull with an easy undertone, and while prices are not materially changed it would not be difficult to obtain concessions on some grades. We quote dealers' prices here as follows:

Old No. 1 R. R. wrought, net tons	$11.00 to 12.00
Cast machine and fdy., net tons	12.00 to 12.50
Old iron rails, gross tons	16.50 to 17.50
Old steel rails (re-rolling) gross tons	12.50 to 13.00
Old short lengths, gross tons	12.50 to 13.00
Old iron axles, net tons	16.50 to 17.50
Heavy melting scrap, gross tons	12.00 to 12.50
Stove plate, net tons	9.50 to 10.50
Wrought turnings	5.50 to 6.50
Cast borings, net tons	4.50 to 5.50
Car wheels, gross tons	16.50 to 17.50

PHILADELPHIA.

Irregularity of Pig Iron Prices—Railroad Outlook Brighter.

Office of THE IRON TRADE REVIEW,
408 Central Trust Bldg., May 12.

Pig Iron.—A wide range in prices has resulted from the decision to let the market take its own course, and it is difficult to fix them with anything like precision. A few furnaces still refuse to consider any offer of less than $18.25 for No. 2X foundry, and from that figure the quotations scale down to $16.75, which is believed to be the very lowest price made by any northern furnace, and that by only one or two. Prices quoted to consumers cover the whole range of $1.50 between these two limits, but seem to be mostly from $17 to $17.50. In the rather confused condition of the market caused by this change of base, no important sales have been made. Consumers are naturally holding off for a few days to see how prices shape themselves under the new order of affairs, and furnace men are not pressing sales. There has been a decided increase in inquiries, and doubtless the business will follow before long. As yet, however, inquiries among foundrymen show no increase in new business, and few establishments are doing as much as 50 per cent of their capacity. Prices, as has been said, cover a wide range, but good standard northern irons can be had for about the following prices:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	16.75 to 17.50
No. 2 plain	16.50 to 17.00
Standard gray forge	15.75 to 16.25

Basic	16.25 to 16.75
Low phosphorus	21.00 to 22.00
No. 2 Birmingham	15.70 to 16.20
No. 2 Virginia	17.00 to 17.50

Finished Material.—Pending the final adjustment of the pig iron situation and the meeting to be held in New York next week, when the prices of finished materials will be further discussed, there is little new business coming out, as might naturally be expected. It is well known that there is considerable new work being held up in anticipation of lower prices, and if these come soon, orders will be placed. The Baldwin Locomotive Works, which pretty accurately gage the railroad situation, report a brighter outlook, and there are some large building operations in the city which will soon be under way. Iron bars continue the weakest feature. Prices as yet show no change, as follows: Structural material, 1.85c to 2c, according to specifications; steel plates, 1.85c to 1.90c; refined iron bars, 1.45c to 1.55c; steel bars, 1.75c to 1.80c.

Old Material.—An order for 2,000 or 3,000 tons of cast borings advanced prices for that line a little, and there are one or two other slight increases, but the general market continues extremely dull, the mills purchasing very little. Prices follow:

Old steel rails	$14.50 to 15.00
No. 1 steel scrap	12.75 to 13.25
Old steel axles	17.00 to 17.50
Old iron axles	19.50 to 20.00
Old iron rails	16.50 to 17.00
Old car wheels	13.50 to 14.00
Choice scrap R. R. No. 1 wrought	15.25 to 15.75
No. 1 yard scrap	12.00 to 12.50
Machinery scrap	13.50 to 14.00
Low Phosphorus scrap	17.50 to 18.00
Wrought iron pipe	11.00 to 11.50
No. 1 forge fire scrap	10.50 to 11.00
No. 2 forge fire scrap, ordinary	8.50 to 9.00
Wrought turnings	9.50 to 10.00
Axle turnings, heavy	10.50 to 11.00
Cast borings	9.00 to 9.50
Stove plates	11.00 to 11.50

BUFFALO.

Slight Improvement in Pig Iron—Steel Pile Driving Continues.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, May 12.

Pig Iron.—So far this month, the market has shown a slight improvement, as compared with April. More iron is being sold right along, but it is still in small lots and little, if any, is for delivery beyond the first half. Prices show a considerable range and it is evident that, for one reason or another, certain furnaces are making sales at their own figures. Quotations made on the basis of the schedule below have been answered with information that the prospective buyer has purchased elsewhere at lower figures, in one case to the amount of $1.35 a ton. We quote as follows, f. o. b. Buffalo:

No. IX foundry	$16.80 to 17.30
No. 2X foundry	16.30 to 16.80
No. 2 plain	15.80 to 16.30
No. 3 foundry	15.30 to 15.80
Malleable Bessemer	16.50 to 17.00
Gray forge	15.00 to 15.50
Charcoal	21.00 to 21.50

Finished Materials.—The driving of the test lots of the Friestedt and United States sheet pilings of the Carnegie Steel Co. in the construction of the cofferdam for the new government ship lock in Black Rock harbor, Buffalo, has about been completed. Two additional pockets of the sheet piling of the Lackawanna Steel Co. are being driven. Work will likely be commenced this week on the piling of the Jones & Laughlin Steel Co. The trade in finished lines shows some little improvement.

Bids are to be opened at Albany, June 2 for a new state building for the department of education and the state library. About 12,000 tons of structural steel are involved.

ST. LOUIS.

One Large Lot of Pig Iron Sold—New Buildings Planned.

May 11.

Pig Iron.—Despite the fact that last week was one of the dullest periods ever experienced in the pig iron business in the St. Louis territory, and the further fact that prices declined 25 cents, one sale of 10,000 tons was booked by the DeCamp Bros. & Yule Iron, Coal & Fuel Co. for shipment over June, July and August. This iron was purchased by one of the largest melters in the territory, it is asserted by persons well posted in the business, but who declined to divulge the name of the purchaser or the price at which the iron was sold. The sellers were interviewed by a representative of THE IRON TRADE REVIEW, and they confirmed the sale, stating that the same purchasers probably would increase the order within the near future. No additional information beyond a confirmation of the sale could be elicited from the sellers. The meeting of the leading pig iron interests in New York has not affected the St. Louis market at all, according to statements made by prominent dealers.

A fair number of orders were received last week outside of the 10,000-ton sale, for southern foundry iron, at prices ranging from $11.75 to $12 for No. 2, Birmingham basis, mostly for shipment during the next three and four months. Some of the larger buyers are feeling the market with a view to making purchases when they find the price satisfactory.

Our quotations, f. o. b. St. Louis, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$16.00 to 16.25
No. 2 southern	15.50 to 16.00
No. 3 southern	15.00 to 15.50
No. 4 southern	14.50 to 15.00

Coke.—Most of the business placed during last week was for spot shipment with some few contracts running as far ahead as July 1, 1909, but a majority of the contract business covered territory up to Jan. 1, next. The aggregate of the contracts taken did not amount to a very large tonnage, but it made a better showing than the previous week. Prices on the best selected Connellsville 72-hour foundry coke ranged from $2.15 to $2.50 a ton, ovens, the higher figure being for long delivery only. Connellsville 48-hour furnace coke was quoted at $1.50 to $2, ovens, for all deliveries. Virginia 72-hour foundry coke was quoted at $2.25 ovens for immediate and future shipments. The freight rate from Connellsville and the Virginia fields is $2.80 to East St. Louis, $2.90 to St. Louis, and $2.40 when destined beyond St. Louis.

Finished Material.—Plans for new buildings made public last week gave renewed activity in structural material. Plans have been drawn for an 11-story hospital building to be erected on the city hospital grounds. The building will be 200 x 50 feet. President O'Reilly, of the board of public improvements, will have charge of the erection, and will let the contract for the work. Plans have also been completed for the Altoona Investment building, a six-story structure costing $50,000, to be erected at 913 Pine street, and two apartment buildings, costing $100,000, are to be erected at the southwest corner of Lindell boulevard and Vanderventer avenue, according to announcements made during last week.

Old Material.—The market remains dull, with quotations unchanged, as follows:

Cast iron borings, free from foreign material, net ton	$ 4.50
Steel axle turnings, net ton	8.00
Steel railroad axles, net ton	13.50 to 14.00
Iron railroad axles, net ton	15.50
Miscellaneous steel scrap, gross ton	10.25
Old car wheels, gross ton	14.00 to 14.50
No. 1 railroad cast scrap, net ton	11.00
Heavy machinery cast, net ton	12.00
Stove plate and light cast, net ton	10.00
Sheet iron, net ton, uncut	3.50
No. 1 railroad wrought, net ton	10.50 to 11.00
Railroad malleable, net ton	11.50
Heavy melting steel, net ton	10.00

BIRMINGHAM, ALA.

Conditions Might be Much Better—Some Increase in Production.

May 11.

The southern pig iron market presents plenty of room for improvement,

but some of the manufacturers assert that their sales are about equal to the make. The Sloss-Sheffield Steel & Iron Co. now has four out of seven furnaces in operation, the No. 1 city furnace doing well again. The Birmingham Coal & Iron Co. has blown in its new Vanderbilt furnace and put out its little old furnace for repairs. The two furnaces will increase the daily production about 300 tons.

George G. Crawford, president of the Tennessee Coal, Iron & Railroad Co., has given out a statement in reference to the steel plant at Ensley and the rolling mills at Bessemer, in the Birmingham district. He announces that these industries will resume operation by June 15.

GERMAN IRON MARKET

Conditions Discouraging—Pig Iron Stocks Increase.

Dusseldorf, May 1.—When looking at the reports of the Berlin stock exchange, one would get the impression that business had improved and that everything was going well, because the demand for coal and iron shares has become much stronger during the last fortnight, and the standing of a great number of shares is 5 to 10 per cent higher. This improvement was caused in the first place by the reduction of our bank rate by ½ per cent, being now 5 per cent, and in the second place by the fact that the coal syndicate has increased the capacity of its mines by 2½ to 5 per cent. However, the whole movement at the stock exchange is a mere flash only.

In pig iron the situation is not better, but possibly worse. One furnace is blown out after another and notwithstanding the decreased production, stocks are growing further. On the other hand, the import of English pig iron is further increasing.

The whole market is dull and discouraging.

METAL MARKET

NEW YORK.

May 12.

There has been little change in the non-ferrous markets except for the sharp advance in lead, due to the action of the leading producer. Copper is fairly firm at unchanged prices. Pig tin is not active. We quote prices at close of business Monday, as follows: For spot delivery, New York: Lake Copper, 12⅝c to 13c; electrolytic copper, 12½ to 12¾c; casting copper, 12¼c to 12½c; pig tin, 31.65c to 31.90c; pig lead, 4.20c to 4.30c; spelter, 4.60c to 4.70c; antimony (Cookson's) 8¾c to 9¼c; antimony (Hallett's) 8½c to 8¾c; antimony (ordinary brands) 8c to 8½c.

CHICAGO.

May 12.

Both buying and inquiry for metals in this market are very light. Prices quoted on copper are for small lots of a few tons. Carload lots can be obtained at one-fourth cent lower. Lead in small lots is bringing about 4⅜ cents. We quote:

Lake copper, 13½c to 13¾c; casting, 13c to 13¼c; pig tin, 32¾c to 33¼c; spelter, 5.10c to 5.25c; pig lead, desilverized, 4.20c to 4.30c in 50-ton lots; corroding, 4.70c to 4.80c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 7c list, f. o. b. LaSalle, in car lots of 600-pound casks; Cookson's antimony, 11c to 11½c; other grades, 10c to 10½c.

Prices of old metals remain unchanged from a week ago and we quote to dealers as follows:

Copper wire, 10½c; heavy copper, 10½c; light copper, 9½c; heavy red brass, 10c; heavy yellow brass, 8c; light brass, 5½c; No. 1 red brass borings, 8½c; No. 1 yellow brass borings, 7½c; brass clippings, 8c; tea lead, 3¼c; lead scrap, 3½c; zinc, 3¼c; tin pipe, 25c; tin foil, 22c; pewter, 17c; electrotype plates, free from wood, 4c; electrotype dross, 2¼c; stereotype plates, 4½c; stereotype dross, 3c; prime slab zinc dross, $62 per ton.

ST. LOUIS.

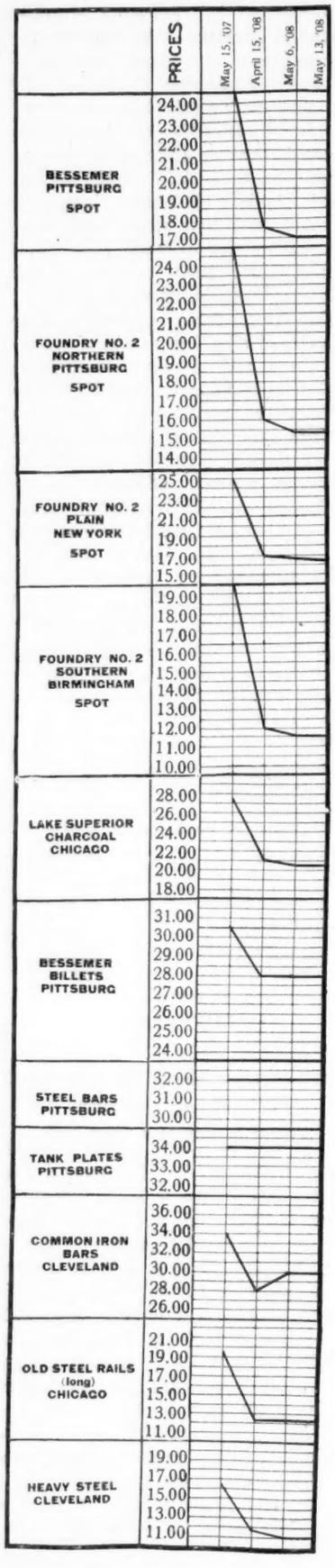
May 11.

Lead and Zinc.—An advance of $1.50 a ton on lead ore was reached in the Joplin district last week, sending the price up to $56.60 as the top notch for choicest grades. This advance was the result of the competition of one company. Other smelters declined to meet it, and although the company making it made heavy shipments, the shipments as a whole registered a slight decline.

Zinc ore remains steady at $39 for the highest grade on an assay basis ranging from $36.50 to $34 a ton for 60 per cent ore. The range was the greatest that has been shown in several months. Production was heavy throughout the district, and competition was keen at the close of the week.

The total shipments for the week from all of the camps in the district were: Zinc, 9,198,590 pounds; value, $155,178. Lead 1,538,060 pounds; value, $41,180.

PRICE CHART.



GETTING WORSE.

Severe Competition and Little Business in British Iron Trade.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 2.

The general condition of the iron trade shows no improvement. On the contrary, there has been marked giving way in all directions during the past fortnight. As usual, the finished lines are showing much less life than the pig iron department, and in the Birmingham district the competition is so severe that prices continually tend downwards. Hoops, for example, have fallen from £7 10s to £7 7s 6d. Reductions in unmarked bars are constant, so that from £6 15s a few weeks ago prices have fallen rapidly to £6 7s 6d. The galvanized sheet mills are working only half to two-thirds time, and the black sheet mills are still worse off for work. Throughout the Black country, short time is the rule. Galvanized hollow ware trade seems to be doing as well as any, some of the most favored firms being able to record an output for April quite equal to that of last year. But orders are coming in in small volume, and this trade looks like getting on to short time. In the steel department, things are going from bad to worse, foreign competition being much more in evidence than it was, enormous quantities of billets and bars coming into the country via Newport. America is credited with being the principal source of supply, but fair quantities are also coming from Germany. The cast iron pipe business is worse than for a long time past, but steel foundries, owing to the increasing popularity of steel mill furniture, are doing better than the iron founders. Great expectations prevail as to the excellent results likely to follow from the new patents act under which British patents will have to be worked in this country and it is said that Germany is about to erect very large works on the banks of the Dee for carrying out various industries working British patents.

Labor troubles are more in evidence than for some time past. The Iron Founders' Federation has given notice through a conference at Glasgow of a reduction of 1 shilling per week on time and 5 per cent on piece work for molders. The men have already decided to strike against this, and are expected to come out to the number of 10,000.

The only event of any interest in the pig iron business this week was a "squeeze" on Monday last, owing to the excessive delay of the "bears" in covering their requirements, the effect of which was to suddenly run up prices for Cleveland iron so that 52s 9d ($12.90) was paid on cash transactions. The reaction came swiftly after 12,000 tons had been done, and the end of the week finds prices substantially the same as a week ago. The weakness of the market is shown by the offers of 48s 3d ($11.80) as compared with 51s 6d ($12.60) the current quotation. Stocks show wonderfully little change. The shipments for April were 110,181 tons as compared with 163,115 tons in April of last year, and 123,479 tons in April, 1906. The peculiarity of the stocks is that all but 400 tons is of No. 3 quality. For foundry grades, there is actual scarcity. The trade must be injuriously affected by the ship building lockout which commences today, the effect of which will be to throw out of work 15,000 out of 80,000 engaged in the trade. A supporting element in regard to prices is the comparative dearness of coke, which during the last week or two has shown increased firmness, and fuel generally is strong. The Midland districts, such as Northampton, Derbyshire, and Staffordshire, show rather more strength than the north, partly because these markets are much less dependent on the steel trade, which at present is showing great dullness and is more directly affected by the stagnation of ship building. The few buyers who are on the market are pressing strongly for reductions, and in a quiet way a few concessions are being obtained, but the market has not materially changed. In the hematite department west coast mixed numbers continue at 62s ($15.18), but on the east coast there has been a slight fall bringing the figure to 58s 6d ($14.32).

P. & L. E. Gets Into Sharon.—The Pittsburg & Lake Erie railroad is concluding an agreement with the Erie railroad, which will give to the P. & L. E. trackage privileges over the New Castle & Sharon, a 20-mile branch of the Erie running from New Castle to Sharon, Pa. This new arrangement will give the P. & L. E. direct entrance into the Shenango valley for Connellsville coke.

The National Bolt & Nut Co., Sixty-second and A. V. R. R., Pittsburg, is increasing its capacity in the tapping and nut department about 25 per cent by the addition of new equipment.

CINCINNATI NEWS NOTES.

Business in the machine tool line shows practically no change and the shops are running at about the same rate as in the preceding week. A slight improvement is noticeable in the boiler work and contracts, which is regarded as attributable to spring building and the installation of steam and hot water heating plants rather than to steam engine equipment. Engine builders report considerable inquiry, but inability to close up and book orders, the tendency being to defer such purchases. Foundries continue to run light and pig iron buying is confined to immediate needs.

The nominating committee of the Iron Buyers' Association selected to nominate candidates for the presidency of the association owing to the resignation of William Fetzer, have nominated G. H. Gorman, treasurer and purchasing agent of the Davis Sewing Machine Co., of Dayton, O., and George M. Verity, president of the American Rolling Mill Co., of Middletown, O., and Secretary William Gugenheim is now taking a vote by mail on the two candidates.

W. J. Zimmerman of Portland, Ore., was a visitor here during the week. He was entertained at the Business Men's Club on Wednesday and stated that he expected an improvement in business conditions in the Pacific Coast district in the near future. Mr. Zimmerman is a representative of the following Cincinnati concerns in that territory, the Lodge & Shipley Machine Tool Co., the Cincinnati Milling Machine Co., the Cincinnati Shaper Co., the Cincinnati Planer Co., and the Cincinnati Machine Tool Co.

The Cincinnati Car Co. has this week secured contracts for eight interurban cars, four of which are for the Pittsburg & Butler Traction Co. for high speed general traction service. These orders are encouraging, as they indicate that developments along the line of the interurban railways are progressing.

Cement Plant Completed.—The new plant of the Universal Portland Cement Co. at Universal, Pa., has been practically completed and is now in operation, although not yet at full capacity owing to some arrangements to be made with reference to power facilities. The slag used in the operations is obtained from the Carrie furnaces of the Carnegie Steel Co. The new plant when in complete running order will have a capacity of 4,500 barrels of cement daily.

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SCRAP PRICES OUT OF LINE.

Comparisons are occasionally being made nowadays between prices of scrap iron and steel and prices of finished steel products with the view of showing that prices of the latter are too high. The disparity exists in a measure, but the conclusion is hardly just. It is making the tail wag the dog. Scrap is a fluctuating and speculative commodity while quite a successful effort has been made, for several years, to have prices of finished steel products stable and subject to but slight fluctuations. The plethora of scrap is, in a measure, but an incident in the change in total tonnage movement, whereby the outcome of scrap, at least of new scrap, is related to previous rather than present activity; it lags, in curtailment, behind finished steel. The outcome declined, but not so promptly as the production of new steel, causing a temporary glut which has disturbed its sensitive market, but this will naturally tend to be righted in time. It is, of course, a somewhat unusual phenomenon for old car wheels to go into the open-hearth furnace and take preference over pig iron, as is the case with some works at present, and for reinforcing concrete bars, bedstead angles, etc., made from old rails, to have such price advantage over new material.

The railroads have shown some tendency to complain about the disparity between the price of new rails and the price obtainable for old rails, especially when the rail mills are asking premiums for rails of special composition or method of manufacture. There has been a disparity in the other direction at times, as in 1899 when some railroads actually obtained a higher price per ton for the old rails they took up than they were paying for the new rails they were laying, and which had been contracted for some time before.

There is an important feature in the situation which at one and the same time promises the railroads a better average price for old rails than they have been getting lately, and moves the rail mills to charge a moderately good price for new rails. There are about 300,000 miles of standard railroad track in the United States, containing between 30,000,000 and 40,000,000 tons of rails. An engineer of the Pennsylvania railroad estimates the average life of a rail at 5.8 years, but this could not apply as an average to all systems, since it would call for an annual replacement greater than the production has ever been. It is evident that the average call for replacement is likely to be more than 3,000,000 tons, and the outcome of old rails will be nearly as large. These old rails have great commercial value, as they can be converted at a moderate cost into rails of lighter section, and into various merchant sections, being especially adapted for bedstead angles and reinforcing concrete bars. In these forms the material comes into direct competition with the new steel products of the steel interests. Their usefulness will be still greater when the new thick-base sections begin to come out as old material, as the distribution of metal, almost as much in the flange as in the head, and with the flange, if anything, reduced in width, will favor their being rerolled into a still greater variety of forms and with more satisfactory results all around. The new section is heavier, but not heavier in the head, so that it will lose no greater number of pounds per yard in weight than the old section, through use, while it will weigh more when worn out. The position is trending towards the outcome of several million tons of old rails per year, of an almost ideal section for rerolling. The rail mills cannot afford to keep pouring millions of tons of rails a year into use and have 75 or 85 per cent of the tonnage come back as direct competition, without an adequate return. The railroads, in their turn, should come to realize the value of the material they have been turning into the market and endeavor to secure better prices for it.

THE HIGH PRICE OF BILLETS.

Editor THE IRON TRADE REVIEW:—Referring to the several articles on regulated competition, I believe there is much to be said on both sides, but I do not believe that dictated regulation will bring about desired results, unless it takes into consideration the interests of consumer, as well as manufacturer.

My experience has been that a weak market is influenced by precedent and the basic prices of raw material. The consumer of iron and steel today is too well versed in manufacturing costs to be induced to make purchases, except for immediate needs, when he knows that a margin of profit of $6 to $8 per ton can not be maintained, on this kind of market, without artificial means. He is apt to reason, and not without cause, that some manufacturer is going to "jump the fence," or, at least, toss a few tons over to confidential customers, with the inevitable result of an open market.

The injustice of high prices for billets, etc., as mentioned by the Kansas City Bolt & Nut Co., in its letter to you, is unquestioned, as it is common knowledge that the manufacturers of billets are making very low prices on finished material, in some cases even selling under the price of billets. This is especially true of rails under 50-pound section on which there is no agreed prices. Light rails have been sold within the past 90 days, and specified as rolled from billets, as low as $24 gross ton at the mill. These prices were made in competition with rails rolled from old standard sections.

Buyers of tonnage will not be induced to place contracts until steel is sold somewhere nearer the basis of cost with a reasonable profit added, and that basis must be reached at one cut. Then with a slight advance the timid buyers will crowd each other to get in on the ground floor.

A. F. BAUMGARTEN.

Keystone Rail & Equipment Co., Pittsburg, May 12, 1908.

NEW RECORDS

For Annual Ore Shipments to Furnaces and Ore on Docks May 1.

Statistics gathered by the *Marine Review* from the various dock managers at Lake Erie ports show that the amount of ore on Lake Erie docks May 1 of the present year was 5,480,300 gross tons, as against 1,976,988 tons in 1907, an increase of 3,503,312 tons. The largest tonnage ever before on docks on May 1 was in 1904, when there were 4,534,103 tons.

The total rail shipments from Lake Erie ports to furnaces during the winter season (Dec. 1 to May 1) aggregated 1,905,428 tons, viz.:

On dock Lake Erie ports, Dec. 1, 1907.7,385,728
On dock May 1, 1908.....5,480,300

By rail to furnaces, winter of 1907-8.1,905,428

Adding these winter shipments to 29,787,018 tons, the amount shipped to furnaces during the navigation season of 1907, gives 31,692,446 tons as the entire shipment of ore from Lake Erie ports during the year ended May 1, 1908. The following table gives the amount of ore on dock at the opening of navigation and ore shipments for annual and winter periods for the years stated:

ORE ON LAKE ERIE DOCKS, MAY 1, EACH YEAR FOR TEN YEARS.

Year.	Gross tons.	Year.	Gross tons.
1908	5,480,300	1903	3,592,367
1907	1,976,988	1902	2,848,194
1906	1,791,090	1901	3,050,183
1905	2,271,631	1900	1,720,656
1904	4,534,103	1899	2,073,254

ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACE, YEARS ENDING.

Year.	Gross tons.	Year.	Gross tons.
May 1, 1908	31,692,446	May 1, 1903	21,905,251
May 1, 1907	30,099,769	May 1, 1902	17,216,065
May 1, 1906	28,984,358	May 1, 1901	14,468,260
May 1, 1905	20,057,070	May 1, 1900	15,882,881
May 1, 1904	18,739,995		

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, DURING WINTER PERIOD, DEC. 1 TO MAY 1.

Winter of.	Gross tons.	Winter of.	Gross tons.
1907-08	1,905,428	1902-03	3,481,887
1906-07	4,275,467	1901-02	3,011,469
1905-06	4,672,638	1900-01	2,854,487
1904-05	3,491,768	1899-1900	3,809,627
1903-04	1,836,982		

IRON ORE ON LAKE ERIE DOCKS—GROSS TONS.

	Opening of Navigation			Close of Navigation		
Ports—	May 1, 1908.	May 1, 1907.	May 1, 1906.	Dec. 1, 1907.	Dec. 1, 1906.	Dec. 1, 1905.
Toledo	217,788	147,397	52,550	518,645	281,000	368,024
Sandusky	42,256	5,439	29,320	44,546	17,467	52,977
Huron	392,731	98,106	80,738	415,730	245,499	208,023
Lorain	327,052	176,300	140,452	366,271	336,321	271,695
Cleveland	1,029,198	447,573	350,382	1,281,335	1,224,606	1,330,619
Fairport	225,328	154,246	266,162	523,981	590,783	759,961
Ashtabula	1,799,454	568,485	462,564	2,056,820	1,631,312	1,589,951
Conneaut	462,392	130,853	148,528	1,090,774	1,057,424	976,976
Erie	595,660	189,276	169,488	652,219	552,631	564,961
Buffalo	388,441	50,313	90,906	435,407	315,412	315,780
Total	5,480,300	1,976,988	1,791,090	7,385,728	6,252,455	6,438,967

NO CHANGE MADE.

At the bi-monthly examination of the sales sheets of the manufacturers of bar iron at Pittsburg, Monday, it was found that the scale of wages for the puddlers and the finishers during the months of May and June will remain the same as in March and April. The settlement was based upon a 1.45c card and the boiling wage will remain $6.12½ per ton.

The adjustment of the wages of sheet and tin workers, showed no change as to sheet workers, the previous bi-monthly scale having been down to base prices. The scale of the tin workers, however, will be lower during the next 60 days being upon the base prices whereby the previous adjustment was upon 2 per cent above the base prices.

BAR MILL EMPLOYES TALK NEW WAGE SETTLEMENT PLAN.

In casting about for a satisfactory method of annual wage settlement, the Amalgamated Association of Iron, Steel and Tin Workers now in annual convention at Youngstown, O., seems to be most impressed by the so-called local settlement plan. President P. J. McArdle, in his annual report, favored this settlement for each mill by local committees rather than the general conferences which have been the rule heretofore for many years.

The convention has practically adopted the present wage scale in force as its convention scale for 1908 and 1909. No material change in the present 1907-1908 wage scale was suggested. At the conclusion of the convention, the conference committee of the union will present the convention scale to a committee of the manufacturers and negotiations will then be conducted for the determining of the permanent 1908-1909 scale.

NATIONAL MANUFACTURERS WILL MEET IN NEW YORK.

The seventeenth annual convention of the National Association of Manufacturers will be held at the Waldorf-Astoria hotel, New York City, May 18, 19 and 20. Many questions essential to the welfare of the association will be considered; the officers will submit their annual reports; a full report on the legislative situation will be made, and the standing committees of the association will report on the subjects assigned to them. Among the speakers at the association banquet on May 20, will be Congressman Charles E. Littlefield, on "The Issue That Confronts Business Men;" Senator Albert J. Beveridge, on "Why a Non-Political Commission Is Essential to Tariff Reform;" Wu Ting Fang, minister from China; Governor J. F. Fort, of New Jersey; James A. Emery, and others.

MEETING OF THE OHIO ENGINEERS.

The semi-annual meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers will be held in the auditorium of the Hotel Chittenden, Columbus, O., May 22 and 23. The program is as follows:

Friday afternoon, May 22.—Visit the engineering department of Ohio State University. Friday evening, 8 P. M.—Paper, "Producer Gas Plants," by R. H. Fernald; paper, "Gasification of Low Grade Fuels," by L. G. Finlay.

Saturday, May 23, 9 A. M.—Business meeting of council. 10 A. M.—Business meeting of the society to receive report of the secretary, treasurer and council; paper, "Report of Committee for Memorializing State Legislature on Industrial Education," W. T. Magruder; paper, "Construction of Catenary Trolley Wire," T. W. Shelton. 1:30 P. M.—Excursion to the dam and filtration plant and the municipal electric lighting plant. 8 P. M.—Paper, "Some Data on the Water Purification Works at Columbus," W. W. Jackson; paper, "A Description of the Cleveland Garbage Disposal Plant," W. J. Springborn.

ALUMNI SUPPORT DEAN KENT.

At a meeting of the Pittsburg Alumni of Syracuse University, May 4, the situation at the university as regards the dismissal of Dean Kent was thoroughly discussed and resolutions adopted, declaring their confidence in the deposed dean; that his reputation has been unjustly dealt with summarily, and requesting the executive committee of the board of trustees to reconsider its action.

CONVENTION OF SUPPLY AND MACHINERY DEALERS.

Richmond, Va., May 13.—The joint convention of the Southern Supply and Machinery Dealers' Association, the American Supply and Machinery Manufacturers' Association, and the National Supply & Machinery Dealers' Association opened at the Jefferson hotel Wednesday morning with a sufficiently large enrolment to insure a record attendance. Tuesday was given up to meetings of the executive councils of the three associations.

For the next meeting place., Cleveland has extended an invitation. New Orleans is also being considered.

No successor has yet been elected for C. H. Zehnder, who recently resigned the presidency of the Allegheny Ore & Iron Co. to devote his attention to his other extensive interests.

PROGRESS AT TORONTO.

Arrangements for the Exhibits of the A. F. A. Convention.

The work of installing the exhibit at Toronto is already well under way. Very nearly all of Machinery Hall has been reserved, and the temporary building will be full to overflowing. The Process building is also filling rapidly.

The cupola which is now being installed by J. de Clercy, of Montreal, is sure to be a center of attraction, as iron will be melted and poured every day. It will be located in the temporary building, where visitors will also find the oil melting furnaces and the core ovens. Naturally, however, the systematic foundryman will wish to know how and where the molds are made before it comes to pouring.

Machinery Hall will contain molding machine exhibits by 10 or 12 different firms, and core making exhibits by two firms, and possibly more. The molds made on these machines will be poured with metal from the cupola. This melting installation is of special interest, on account of the fact that it is planned to run for an hour or two in the morning, to shut the cupola down until after lunch without dropping the bottom, and then to continue melting iron for two hours.

Other melting exhibits will be the well-known tilting crucible furnace made by the Monarch Engineering & Mfg. Co., the double chamber furnaces of the Rockwell Engineering Co., the Schwartz furnaces shown by the Hawley Down Draft Furnace Co., and the gyrating flame stationary crucible furnaces shown by the Kroeschell Bros. Co. The J. D. Smith Foundry Supply Co. will have installed one of its latest models of core ovens.

The molding machine exhibits thus far arranged for, in the order in which they are located in the building, beginning at the southeast corner, include the J. W. Paxson Co., the Arcade Mfg. Co., the Killing Molding Machine Co., the Berkshire Mfg. Co., Henry E. Pridmore, E. H. Mumford, (who will also exhibit the French molding machines made by Ph. Bonvillain and E. Ronceray), the Mitchell-Parks Mfg. Co. (which, with its agents, A. Buch's Sons Co. and the Ontario Wind Engine Co., will show gravity molding machines), the Tabor Mfg. Co., and the Herman Pneumatic Machine Co. All of these machines will be in operation. In addition, several machines will be shown in the Process building, including the Reid molding machine shown by the Hamilton Facing Mill Co., and the Webb molding machine, shown by the Detroit Foundry Supply Co.

Core machines will also be exhibited by George H. Wadsworth, of the Falls Rivet & Machine Co., and the Diamond Clamp & Flask Co.

THE DETROIT FOUNDRYMEN'S MEETING.

On Thursday, April 30, the newly formed Detroit Foundrymen's Association held a meeting which was devoted mainly to a consideration of the coming convention of the American Foundrymen's Association at Toronto, and to the advisability of asking the American Foundrymen's Association to hold its 1910 convention in Detroit.

H. M. Lane, secretary of the Foundry Supply Association, gave an address on "Foundry Association Work," stating what the various associations had done, and also giving an account of the development of convention matters at Toronto to date.

The Detroit members expect to have a very large attendance at Toronto, and to extend an invitation to the association to meet in Detroit in 1910. The question of Detroit's ability to take care of the exhibit was naturally one of great importance, and a committee was appointed to look into this matter with Mr. Lane. It is proposed to offer for the use of the convention and exhibit, the State Fair grounds, where large new buildings have recently been erected. On May 1, the secretary and the Detroit committee visited the grounds, and found that they possessed excellent facilities for the exacting requirements of an exhibit of this nature.

This point assured, it is certain that the Detroit members will press their invitation for 1910 with much enthusiasm.

The Detroit Foundrymen's Association is a thoroughly live body, being composed of active men from all departments of foundry work, including representatives of the brass foundry, gray iron, malleable and steel trades. Detroit, is an important foundry center, and it is evident that this association has a useful future before it, and should the American Foundrymen's Association and its allied organizations decide to go to Detroit, they will certainly be well entertained.

Following the recent shut-down of the rail mill of the Algoma Steel Co., Sault Ste. Marie, Can., both blast furnaces were blown out last week. In a published statement the company says that owing to the world-wide financial troubles, Canadian railroads refuse to place orders for rails.

ADDING TO WORKS.

New England Manufacturers Find Additional Facilities Imperative.

Worcester, Mass, May 9.—The Waterbury (Conn.) Clock Co. has awarded the contract for an additional factory building. Plans call for a five-story brick structure, 40 x 176 feet.

The court has authorized Herbert S. Bullard, receiver of the Hartford (Conn.) Blower Co., to sell the assets of the concern.

The receivers of the Pope Mfg. Co., Hartford, have been authorized to continue the business for the company for a period of four months from April 28.

F. E. Reed Co., manufacturer of lathes, let 60 hands go the other day, and is running on shorter hours. F. E. Reed, president and treasurer of this company, has returned from a two months' sojourn in southern California.

The Worcester Pressed Steel Co. is to build an addition to its plant, to be one story and 30 x 60 feet. It will be devoted to annealing and case hardening. The rolling mill equipment planned last year will be put in this year. The mill will be built for rolling steel up to 16 inches wide, no thinner than 0.015, and up to ¼ of an inch. The Gem Mfg. Co., of Everett, Mass., has been acquired by George F. Higgins of Worcester and interests identified with the Worcester Pressed Steel Co., and the two plants will be operated together, although independent firms. The Worcester plant will devote its energies to heavy, deep drawing, while the Everett plant will handle lighter and larger work exclusively, including a number of specialties.

Will Extract Aluminum.—The Aluminum Reduction Co., Connellsville, Pa., has been organized to extract aluminum from clay. The following directors and officers have been elected: President, J. A. DeWitt; secretary, H. B. Moore; treasurer, Worth Kilpatrick; directors, Worth Kilpatrick, J. D. Madigan, C. H. Brown, H. F. Atkinson and J. A. DeWitt of Connellsville, and H. B. Moore and J. C. Moore of Dawson.

The special meeting of stockholders of the American Steel Foundries to act on the plan to reduce capitalization has been adjourned to June 4. Ninety per cent of the stock has been deposited, but considerable difficulty is being encountered in locating the owners of the other 10 per cent in order to secure their co-operation.

CINCINNATI PLAN

Of Industrial Education May be Adopted in Massachusetts.

Fitchburg, Mass., May 9.—The iron manufacturers of this city at a conference this week with the mayor, members of the city council and school committee outlined a plan for co-operation on their part with the school authorities in a system of industrial training, for high school boys.

Prof. Herman Schneider, of Cincinnati University, who advocated the plan on behalf of the manufacturers, was opposed by one of the aldermen who is a member of the Machinists' union, and this is taken to mean that the Fitchburg labor unions may disapprove of the project if it comes up for consideration later in the school committee.

It is proposed that the boys taking the course should divide their time between school lessons and mechanical work in the industrial plants, one-half of them being in the factory while the others were in school, on alternate weeks, the manufacturers to pay them at the rate of 10 cents per hour at the beginning of the course, increasing the scale one cent per hour every six months. The course would be completed in six years. The mayor has expressed himself as in favor of the project. Daniel Simonds and Charles Fosdick, representing the manufacturers, are prime movers in the matter.

Prof. Schneider at Worcester.

Worcester, Mass., May 8.—At the meeting and banquet tonight of the Worcester branch of the National Metal Trades Association, President E. M. Woodward presiding, Prof. Herman Schneider, of Cincinnati, was the guest and speaker of the occasion. He described the plan of co-operative industrial education that is in operation in Cincinnati, whereby students are given practical work in connection with their text-book studies by special arrangement with the manufacturers in that city. Many manufacturers were present, as well as prominent citizens, including the superintendent of schools and Y. M. C. A. secretary, who are interested in the subject.

Soho Men Banquet.—The employes of the Soho department of the Jones & Laughlin Steel Co. held their first annual banquet at the Hotel Henry, Pittsburg, May 9, and spent an evening of good fellowship. Speeches were made by W. L. Jones, general manager of the company; R. B. Kernohan, general superintendent; G. M. Laughlin, general superintendent of the Soho department; J. E. McCloskey, superintendent of the Soho department, and E. L. Messler, superintendent of the Eliza furnaces. A musical program was also rendered. The menu was appropriately given in iron and steel terms. The banquet is to be made an annual affair of the company.

MR. ROGERS' STATEMENT.

Following the meeting last Thursday in New York of the pig iron and iron ore committee, Wm. A. Rogers made the following statement:

Owing to the fact that much erroneous information has been disseminated concerning the purpose of this meeting of pig iron and ore producers, it is thought desirable to make a statement which embodies the views of all present.

The meeting was called for the purpose of hearing reports from the blast furnace interest of all sections of the country in regard to general conditions as affecting particularly the foundry iron trade. Prices of pig iron were only incidentally referred to. There is no agreement to maintain the price of pig iron. Producers in different sections of the country are making quotations based on their cost of manufacture and the measure of their necessities. Prices are now $8 or more below the high mark of eight months ago and are almost without exception below the cost of production at northern and eastern furnaces and, with the exception of a favored few, below cost at southern furnaces.

Information received indicated that producers of Lake Superior ore are materially curtailing production and, from the information received, it is believed the price of ore for this season will not be reduced below the price of last year.

BRITISH OUTFIT OF PIG IRON IN 1907.

According to returns which have been collected by the British Iron Trade Association the total production of pig iron in the United Kingdom in the year 1907 was 9,923,855 tons, which compares with a production of 10,149,388 tons in 1906, 9,592,737 tons in 1905, and 8,562,658 tons in 1904.

In the year 1907 the production of pig iron was 225,532 tons less than in 1906, and 331,119 tons greater than that of the year 1905.

The ways and means committee of the national house of representatives has reported to the house resolution 363 which asks that the secretary of the treasury be requested to show by what authority 207,068 tons of manganese ore were admitted free of duty at various ports of entry for the year ending June 30, 1907.

WESTERN FOUNDRYMEN FORM ASSOCIATION.

Practically all the foundries in Western Missouri, Kansas, Arkansas and Oklahoma were represented at the meeting of foundrymen, May 2, at Joplin, Mo., when the Western Foundrymen's Association was formed. The declared purpose of the association is to take up at meetings topics of general interest to the trade looking to obtaining better results in foundry practice; the adoption of a form of pig iron contract more advantageous to the foundryman's interest; greater unity of action in handling the labor question; and a full and free interchange of ideas among members that can not fail to be productive of most beneficial results. Among cities represented by delegates at the meeting were Little Rock, Ark.; Aurora, Webb City, Joplin, Springfield, St. Joseph and Kansas City, Mo.; Fort Scott and Topeka, Kans.; McAlester, Oklahoma City and Bartlesville, Okla. A constitution and bylaws were adopted and a general plan of work was formulated.

The following officers were chosen: Dr. A. D. Thomas, of the Thomas-Fordyce Mfg. Co., Little Rock, Ark.; vice president, J. A. Rogers, of the Rogers-Conklin Mfg. Co., Joplin, Mo.; secretary and treasurer, H. T. Hornsby, of the United Iron Works Co., Springfield, Mo. The next meeting of the association will be held at Joplin, Mo., June 13, at the new Connor hotel. The dues are placed at $5 per year, and no salaries are paid to officers, thus making membership easily within the reach of every foundry, no matter how small.

Creditors' Payment Authorized.—Judge Hazel, of the federal court, has granted an order to the receivers of the New York State Steel Co., Buffalo, N. Y., authorizing them to make a payment of 25 per cent of the total due unsecured creditors, the interest on the bonded indebtedness, about $75,000, and to return ore sold the company by Corrigan, McKinney & Co., Cleveland, in settlement of a claim for about $100,000.

Exports of iron and steel from the United Kingdom for the first three months of this year show a decline compared with the corresponding months of last year of 279,000 tons in volume, and of $9,195,251 in value.

Wages of iron and steel workmen in the northern and northeast British district have been reduced 2½ to 5 per cent.

SOME DENIALS.

The following newspaper reports are officially pronounced to be without foundation:

1. That the National Tube Co. is arranging to add another blast furnace to the Monongahela group.

2. That the United States Steel Corporation is to create another Gary, Ind., at Texas City, just across the bay from Galveston, Tex., and that it has acquired large ore beds in the Rusk district.

3. That the Corporation is optioning additional land about Bessemer, Ala.

4. That the Corporation intends to begin operations at an early date at Sandwich, Ont.

5. That the Midland Steel Co., Midland, Pa., will erect two new blast furnaces.

BARABOO PROPERTIES ACQUIRED.

It is officially announced that the United States Steel Corporation, through the Oliver Iron Mining Co., has taken over the Baraboo range ore lands held by LaRue and Whitesides, of Duluth. These lands are in South Central Wisconsin. In the same territory extensive holdings were recently acquired by Rogers, Brown & Co., and by the International Harvester Co. The deal to the Oliver company was closed some time ago, but the final papers were passed only recently.

OBITUARIES.

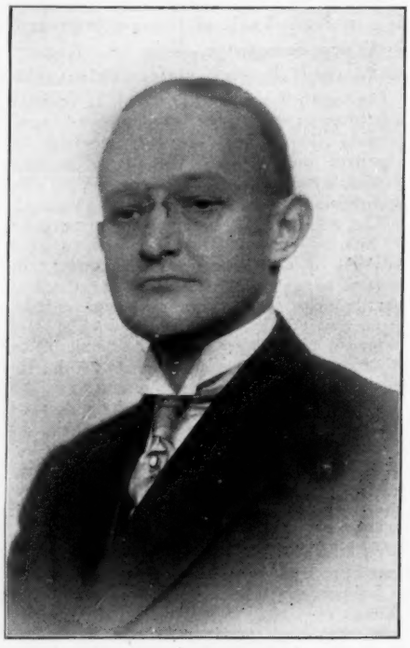
D. O. Settlemire, president of the Mt. Vernon, Ill., Car Works, and of the Litchfield Banking & Trust Co., died at Litchfield, Ill., May 7.

Elmer E. Reynolds, manager of the American Wire Cloth Co.'s plant at Clinton, Ia., died April 24, at a Chicago hospital, aged 46 years.

Charles L. Lovering, treasurer of the Merrimac Mfg. Co., died May 1, at his home in Taunton, Mass., aged 76 years. He was widely known in manufacturing and educational circles, being active as a trustee of the Massachusetts Institute of Technology.

Joseph W. Russell, a well known iron manufacturer of Sharon, Pa., died May 8 from heart disease. He was born in Philadelphia 71 years ago, and learned the molder's trade. For years he operated an iron foundry in West Middlesex, Pa., and Hubbard, O. In 1892, with others, he purchased the plant of the Etna Foundry & Machine Co., at Warren, O., and was president of the company at the time of his death. For the past year he made his home at Sharon. Mr. Russell represented Mercer county, Pa., in the state legislature in 1884.

Bernard Keiser, for many years engineer for the Thomas Iron Co., Hokendauqua, Pa., and later of the foundry and machine company of Barber, Keiser & Co., Allentown, Pa., died April 30, at Fullerton, Pa., aged 80 years. He had retired from active business about 25 years. He was the father of H. B. A. Keiser, formerly chief engineer for the Carnegie Steel Co., residing at East Cleveland, O.;



A. M. Castle.

Frank B. Keiser, superintendent of the southern furnaces of the Republic Iron & Steel Co., Birmingham, Ala., and Edward H. Keiser, professor of chemistry at Washington University, St. Louis, Mo.

John A. Erner, president of the Erner Electric Co., Cleveland, died May 6.

A. M. Castle, founder and executive of the firm of A. M. Castle & Co., Chicago, died May 8 at his home. He was a sufferer from diabetes. Mr. Castle was born in Chicago, Nov. 11, 1863, and spent most of his life there. In 1893 he organized the company which bears his name and opened a place of business as the representative of the Lukens Iron & Steel Co. and the Chambersburg Engineering Co. This business was developed into one of the large steel and iron jobbing businesses in Chicago, the present firm organizing in 1904. Mr. Castle was particularly a friend of his associates in business and was given to sociability, being a member of the two prominent athletic clubs of Chicago and also the South Shore Country Club.

PERSONALS.

George Gibbs, manager of the Scully Steel & Iron Co., Milwaukee, is now at the Pacific coast, where he will spend six weeks on business and pleasure.

Chas. P. Wheeler, vice president and treasurer of Pickands, Brown & Co., will return from Europe next week. Mr. Wheeler's trip has been of several weeks' duration.

B. J. Mattison has been appointed master mechanic for the Colorado Fuel & Iron Co., succeeding C. H. Stevenson, who recently resigned to go into the coal business.

J. Dix Fraser, of Picton, N. S., recently appointed general manager of the Atikokan Iron Co., Port Arthur, Ont., has taken charge of the plant, which will shortly resume operations.

William C. Tamplin, assistant superintendent of the American Sheet & Tin Plate Co., Sharon, Pa., has been transferred to a similar post with the Demmler works of the company at McKeesport, Pa.

Fred L. Sivyer, vice president and secretary of the Northwestern Malleable Iron Co., of Milwaukee, is seriously ill with typhoid fever. It is said that the patient is improving and has passed the crisis after a siege of six months with the disease.

Edgar D. Stone, who recently resigned his position as general manager of the Etna Steel Co., Etna, Ga., has been chosen vice president and general manager of the Georgia-Tennessee Phosphate Co., with offices at Baxter, Putnam county, Tenn.

Edward D. Busby, formerly with the Midvale Steel Co., is now engaged in the selling department of the Electric Welded Products Co., Cleveland, O., which recently changed its name from the Cleveland Cap Screw Co.

William D. Forsyth, general manager of the Concrete Steel Co., Youngstown, has been appointed assistant to President Julius Kahn, of the Kahn Construction Co. He will be succeeded at the Youngstown plant by William Kane, of the Wagon & Machine Works, Toledo.

Van Leer Wills was last week appointed general manager of the Northwestern Iron Co.'s blast furnace plant at Mayville, Wis., and is now in charge. Mr. Wills has been associated with A. W. Thompson and was in charge of the rolling mills of the Republic Iron & Steel Co., Alabama, at Gates City and Birmingham.

The American Locomotive Co. has taken an order for 30 passenger locomotives for the Paris-Orleans railway.

EMINENT MEN OF THE IRON WORLD

VIII. Powell Stackhouse.[1]

By B. S. Stephenson.

It is now 17 years since Powell Stackhouse assumed the presidency of the Cambria Iron Co., and his elevation to that position followed an apprenticeship over a third of a century long. His record of 52 years of almost unbroken connection with the same interests is unique in the annals of American iron and steel making, but is no more remarkable than the vigorous, aggressive manner in which, at the age of 68, he is still directing the activities of this important corporation.

Yet in the review of his career there is nothing which in itself could be called unusual; it is merely the story of a steady, patient advance, in which every station served as preparation for the one just beyond.

"In all my business life there have been no spectacular or notable events," said Mr. Stackhouse to the writer recently. "All that I can claim is attention to the interests of the company with which I have had the honor to be connected almost continuously since 1856. My 50 odd years' connection with the iron and steel business has produced nothing of importance to the public. It has been merely a busy, plodding and retired life. That is all."

Half a century ago, they held to the homely belief that the successful career must have a foundation of broad, practical experience. That was why, at the age at which the modern youth is still wrestling with the problems of preparatory school, young Stackhouse had completed his education and was securing his first insight into iron making. At first his viewpoint was the backside of the counter in the company's store at Johnstown; a year later it was a more advantageous place—a clerk's desk in the office of his uncle, Daniel J. Morrell, then managing partner, where he had charge of the cost accounts of the firm.

A Broad Business Experience.

Five years as storekeeper and clerk; then two years in active service in the Civil War, a rigorous schooling in the command of men; a considerable term as superintendent of the company's real estate department, its woolen mill and brick yard; seven years as assistant to the general superintendent of the rapidly growing works; three years on the newly developed Superior ranges as general agent for the Republic Iron Co.; then in turn general manager, comptroller and vice president—these were the steps by which Mr. Stackhouse fitted himself for the presidency of the Cambria Iron Co., made vacant, in 1891, by the death

The Stackhouse Home at Wallingford, Pa.

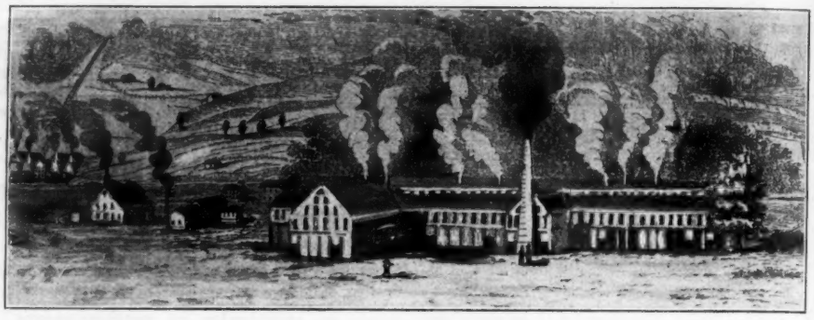
[1]Other biographical sketches in this series are as follows: 1. John Fritz, Feb. 28, 1907; 2. Joseph Wharton, April 4, 1907; 3. Frank J. Hearne, July 4, 1907; 4. Hugh Bell, Aug. 8, 1907; 5. John J. Spearman, Sept. 5, 1907; 6. James M. Swank, Jan. 2, 1908; Sir Alfred Hickman, Feb. 6, 1908.

of Edward Y. Townsend. Seven years later, when the Cambria Steel Co. was organized to succeed to the interests of this company, he was elected to the place he holds today.

It has been the fortune of few executives to enter upon their duties with an experience so broad and comprehensive as that possessed by Mr. Stackhouse, and the proof that it has served him in good stead is evident from the intimacy with which he is able to enter constantly into affairs of even minor importance in connection with the company's management. He is president of a $50,000,000 corporation. Its coal and coke properties are entensive and its blast furnaces can produce 1,000,000 tons of pig iron every year. Its steel plants are of like capacity and there are great works for rolling rails and structural materials, for manufacturing steel cars to the number of 9,000 annually, and for turning out shafting, bolts, axles, rivets and a wide range of other products. He is at the head of allied interests owning three of the best producing iron mines in the Superior district and his company is heavily interested in a large fleet of lake freighters. Twenty thousand men look to these interests for employment, yet he is able to supervise the management of every branch of this company's activities and to give to each the benefit of information gained through those 34 years of preparation for the presidency and those 17 years in that position.

Origin of the Cambria Company.

To sketch the life of Mr. Stackhouse is practically to outline the history of the Cambria interests, for his connection with them began only four years after the formal organization of the Cambria Iron Co. Its actual beginnings, however, date back some 10 years further to 1842, when George S. King & Co. built the Cambria furnace. Almost immediately thereafter, Dr. Peter Shoenberger secured an interest in this property and, largely through his efforts, three neighboring furnaces were built during the next five years. These four small stacks, Cambria, Benscreek, Millcreek and Blacklick, operating with charcoal fuel on the thin veins of native ore, formed the basis of the Cambria Iron Co., organized in September, 1852, with Dr. Shoenberger as president.

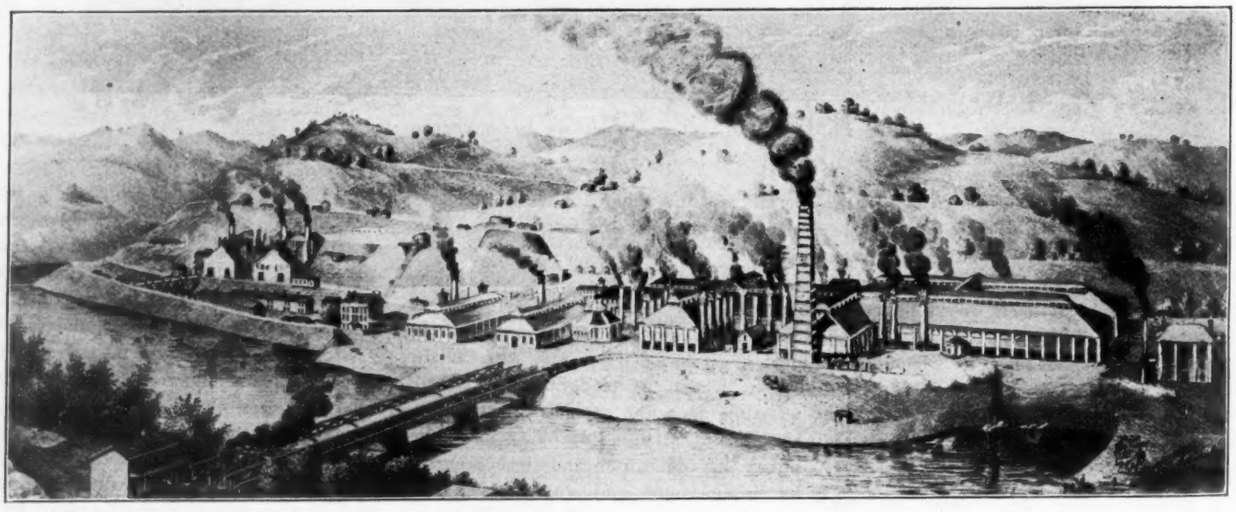


CAMBRIA IRON WORKS, JOHNSTOWN, PA., 1856.

There were promoters in those pioneer days and the quartette of modest stacks, with some ore and timber lands adjacent, were capitalized into a $1,000,000 company. An extensive building campaign was immediately launched. In the spring of 1853, work was commenced on four coke furnaces and a rolling mill, which was completed within the year but did not turn out its first iron rail until July 27, 1855. Most of this large capitalization was represented by properties in the Johnstown district, but little actual cash was paid in and the new company very soon found itself embarrassed for working capital, with the result that, before young Stackhouse came to the works, they had been leased to the firm of Wood, Morrell & Co.

Johnstown 50 Years Ago.

On both sides Mr. Stackhouse was of Quaker ancestry, running back to among the earliest settlers of Pennsylvania. He was born in Philadelphia, July 16, 1840, and acquired his education in the public schools of that city until, at the age of 15, he went to the Johnstown works. Johnstown at this time was of all places in America an inspiring location for the embryo steel maker. It was admittedly the iron making center of Pennsylvania, even then the dominating state in the industry, and boasted at the Cambria plant, a rolling mill with a capacity of 200 tons per week, with the added prestige of having been one of the first on this side of the Atlantic to turn out iron rails. The hills behind the furnaces were amply supplied with coal and ores, hardwood forests were everywhere and the firm of Wood, Morrell & Co. was in flourishing con-



CAMBRIA IRON WORKS, JOHNSTOWN, PA., 1860.

dition. Further than this, the works had in their employ the three Fritz brothers, John, George and "Bill," then engaged in designing and building the three-high mill which was destined to revolutionize rolling mill practice the world over. In the successes of the two elder brothers, young Stackhouse naturally shared the elation of the Cambria organization. "Bill" Fritz, as he says, was younger and was his "particular crony."

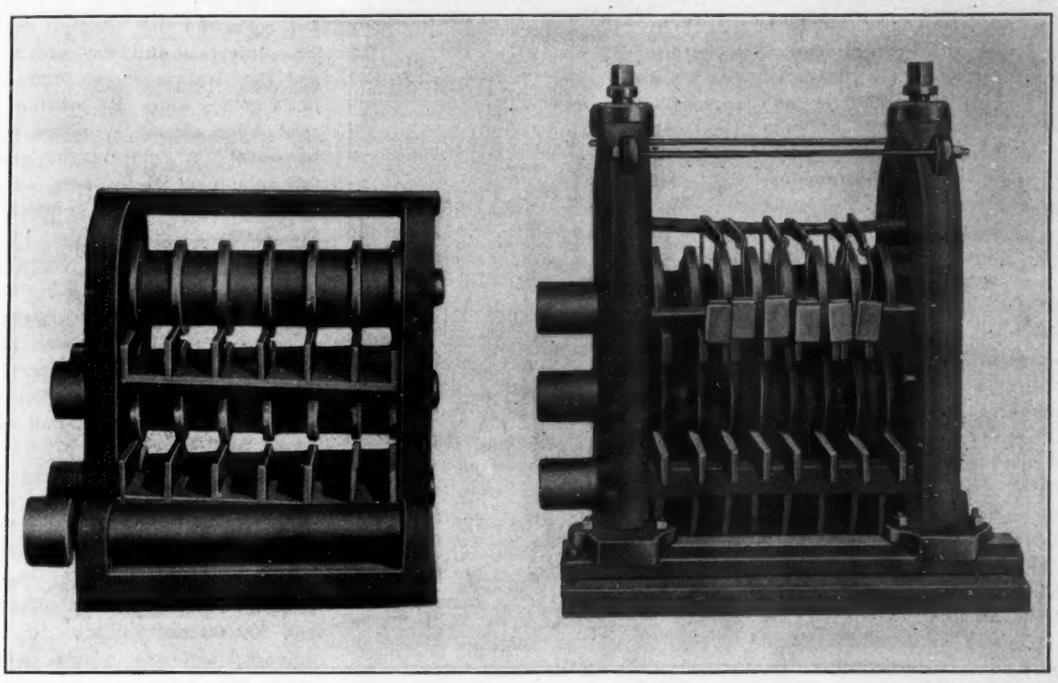
In the Civil War.

If there is one thing of which Cambria county is unusually proud, it is the military record of its sons. When hostilities broke out, Quaker ancestry counted for naught with Mr. Stackhouse, for he was one of the first to volunteer, entering the service in April, 1861, and was an active participant in the final struggles of the conflict. He was mustered in as a second corporal; he left the army as senior major, although business demands twice held him at Johnstown for considerable periods. His war record is, in fact, so remarkable, that it is worthy of the following exhaustive review, prepared for this sketch by James M. Swank:

"In 1861, as a member of the Johnstown Zouave Cadets, under the command of Capt. John M. Power, Mr. Stackhouse responded to the call of President Lincoln for 75,000 troops, immediately following the fall of Fort Sumter. He was mustered into the United States service at Camp Curtin on April 20, 1861, as second corporal, Company K, Third Regiment, Pennsylvania Volunteers. On the expiration of his three months' enlistment, he returned to his employment at the Cambria Iron Works.

"In July, 1862, Mr. Stackhouse aided in recruiting a company of infantry, the command of which was tendered to and accepted by Abram Kopelin, of which company Mr. Stackhouse was elected second lieutenant, and was mustered into the United States service on Aug. 5, 1862, at Camp Curtin, Harrisburg, for a term of nine months. On Aug. 21, 1862, he was promoted to first lieutenant, and with that rank commanded the company from the latter part of November to the termination of his enlistment. Shortly after his return to Johnstown, upon Lee's invasion of Pennsylvania, which culminated in the battle of Gettysburg, the company was reorganized under his command, joined an emergency battalion formed in Johnstown and went to the front, but was not mustered in.

"On Mr. Stackhouse's return to Johnstown in 1863, he was placed in charge of the real estate department of the Cambria Iron Co., the lease of Wood, Morrell & Co. having expired in December, 1862. In September, 1864, he recruited a company, of which he was made captain, which was mustered into the United States service on Sept. 19, 1864, at Camp Cadwallader, Philadelphia, as Company F, 198th Regiment, Pennsylvania Volunteers, commanded by Colonel Horatio G. Sickel—a reorganization of the Third and Fourth Pennsylvania Reserves. This regiment was organized under the auspices of the Union League of Philadelphia and was also known as the Sixth Union League Regiment. On May 1, 1865, Capt. Stackhouse was promoted senior major, vice E. A. Glenn, who died of wounds received in action in the battle of Five Forks, Va. He commanded one battalion of the regiment prior thereto and until it was mustered out at the camp of organization on June 4, 1865. While in the United States service, Major Stackhouse participated in the marches and actions of those commands and was commended by the commanding officers on several occasions."



ORIGINAL MODELS OF THE FRITZ THREE-HIGH MILL, DEVELOPED AT CAMBRIA WORKS. NOW IN MR. STACKHOUSE'S OFFICE.

Three Years on the Ranges.

At the close of the war, Mr. Stackhouse resumed his duties with the Cambria Iron Co. as its real estate agent, and then for two years served as superintendent of a subsidiary concern, the Johnstown Mfg. Co., which operated a brickyard and woolen mill. He was still well under 30 years of age when, in 1868, he was appointed assistant general manager of the Cambria works, a position which he retained until the first of 1874, when he went to Marquette, Mich., as general

agent of the Republic Iron Co. of Michigan. When he returned to Pennsylvania, three years later, it was to settle at Wallingford, a dozen miles west of Philadelphia, where he has since resided.

Daniel J. Morrell, the general manager of the Cambria company, was in Paris during 1878 as United States commissioner at the exposition, and in his absence Mr. Stackhouse was in charge of the Cambria works, continuing in that capacity until his appointment, the following year, as comptroller of the company, with offices at Philadelphia. Upon the resignation of Dr. Charles Stewart Wurtz, in 1884, he succeeded him as vice president of the company, and upon the death of Edward Y. Townsend, in 1891, he was chosen president. In 1898 he was elected president of the Cambria Steel Co., the present operating company. He is also president of the Mahoning Ore & Steel Co., the Penn Iron Mining Co., the Republic Iron Co., the Manufacturers' Water Co., and other corporations owned or controlled by the Cambria Steel Co.

Active at Sixty-Eight.

As is the case with several other prominent figures in the Pennsylvania iron trade, time has touched Mr. Stackhouse but lightly. Today, at 68, he is as active and well preserved as the average business man 20 years his junior. Early and late he is to be found at his roomy office in the Arcade building, Philadelphia, at the modest desk, which has served his purposes for years, or before a small table covered with a mass of correspondence and other papers. His tastes are plain and his comfortable office reflects them. Scattered about its walls are photographs and prints of the early works at Johnstown and an interesting feature is a case containing the original models of the three-high mill developed there by John Fritz.

Mr. Stackhouse is aggressively active in all matters of management to a degree rare in the present day executive. Not a detail of the complicated and widespread interests of the company escapes him; he handles them all in an intimate manner, evidencing his acquaintance with every branch of steel making and reflecting his long experience in the office, at the mills and on the ranges. It has always been a prominent Cambria policy to look after the interests of its employes in the best possible manner and its labor problems have accordingly been a source of exceedingly slight difficulty. There is a reciprocal feeling of good fellowship and common interest between the company and its men which has always contributed in marked degree to the efficiency of the works. During the present period of depression, every effort has been made to provide sufficient work to keep the organization intact and give the thousands of employes at Johnstown a livelihood until a resumption of activities restores the mills to full operations.

Prominent in Steel Institute.

In the movement to bring the various iron and steel concerns of the country into a harmonious course and to concentrate the energies of the entire industry on the task of bringing a return of normal conditions, Mr. Stackhouse has been a leading, though inconspicuous figure. He believes in this movement and is enthusiastic over the formation of the American Iron and Steel Institute, of which he is a director and first vice president.

"If the institute should serve no other purpose," he said recently, "it would accomplish enough to justify its existence simply through the provision it makes for a rallying point for the industry throughout the country. There's a world of good to be gained merely from meeting your competitor on a social basis, in having an opportunity of becoming well acquainted with him in another manner than through business competition, in learning his admirable points and in finding out what a remarkably fine fellow he is, after all. The meetings of this winter have done much in this direction and the institute will continue the good work. It will of necessity be slow and deliberate in working out the lines along which its efforts will be directed, but eventually it will come to deal with the whole industry on a broad basis and will prove a factor of tremendous influence in American business life."

Properities of the Cambria Steel Co.

The blast furnace properties of the Cambria Steel Co. are as follows: Cambria plant, six stacks, at Johnstown, Pa., and Franklin plant, two stacks at Franklin, a suburb of Johnstown. The total annual capacity of the Cambria plant is 650,000 tons and of the Franklin plant 300,000 tons. The product is Bessemer and basic iron, spiegeleisen and ferro-manganese.

ROLLING MILLS AND STEEL WORKS.

Cambria and Gautier plant at Johnstown and Franklin plant at Franklin. The Cambria plant is now equipped with seven Siemens ingot and seven Siemens heating furnaces, six continuous furnaces, 19 reverberatory furnaces and 11 trains of rolls. The Bessemer steel works, built in 1871, were rebuilt and enlarged in 1889 and 1891 and remodeled in 1900. They have four 12½-gross ton converters with an annual capacity of 700,000 tons of ingots.

Open-hearth plant No. 1 of the Cambria plant was built in 1878-9 and now contains two 20-gross-ton furnaces, one built in 1895 and one in 1896, and two 20-gross-ton basic Wellman furnaces built in 1897. Annual capacity, 11,000 tons of acid ingots and 34,000 tons of basic ingots.

The Gautier plant, built in 1878, has four continuous heating furnaces, 10 reverberatory furnaces, eight trains of hot rolls and one train of cold rolls. The universal mill was added in 1906 and can roll universal plates from 8 to 24 inches wide. By moving the vertical rolls, plates 50 inches wide can be rolled. A cold-drawing plant with full equipment of furnaces, shears and special machinery is connected with the works.

Open-hearth plant No. 2 at the Franklin works, was built in 1900-1 and has 15 50-gross-ton stationary furnaces, one two-high 40-inch blooming mill, one set, and one two-high 34-inch slabbing mill, one set, added in 1902, and one 134-inch plate mill added in 1902. Annual capacity, 470,000 tons of basic and 30,000 tons of acid ingots.

The total annual capacity of the three rolling mills and steel works: 700,000 gross tons of Bessemer steel ingots, 545,000 tons of open-hearth steel ingots, 300,000 tons of steel rails, and 500,000 tons of structural shapes, universal and other plates, twisted and other bars for concrete work, plow steel, and steel for tires, springs, toecalks, machinery, harrow discs, rake teeth, etc.

CAR AXLES AND OTHER FORGINGS.

Cambria plant: car axle department. Product, forged open-hearth steel car and locomotive axles, crank pins, piston rods, and miscellaneous forgings toughened by the Coffin process or oil tempered and annealed; annual capacity about 30,000 gross tons.

STEEL CAR BUILDING AND BOLT, NUT AND RIVET WORKS.

Franklin plant; steel car building department. Product, gondola, hopper gondola, hopper, flat, and other steel freight cars; also composite cars with steel underframes; annual capacity, 9,000 cars. All cars are built of rolled shapes. This department is equipped with a 1,000-ton hydraulic press with all the latest improvements. The product of the press is used by the company's car shops. Franklin plant; bolt, nut and rivet department. Product,

iron and steel bolts, nuts, and rivets; annual capacity, 9,000 tons.

COLD-ROLLED AND COLD-DRAWN SHAFTING.

Gautier plant: cold-rolling and cold-drawing departments. Product, cold-rolled, drawn, and turned steel shafting, piston rods, and car axles; cold-rolled and drawn screw rods, hexagons, key steel, flats, and squares; also finger bars, knife backs, angles, zees, tees, and other special shapes. Sizes: rounds, 3/16 of an inch to 7 inches; squares, ⅜ of an inch to 3 inches; flats, all sizes of merchant bars, and hexagons, ¼ of an inch to 2 inches. Annual capacity, 18,000 tons. Does not cold roll or cold draw iron shapes.

COAL LANDS, COKE OVENS, IRON-ORE MINES, ETC.

The Cambria Steel Co. operates extensive coal mines in Cambria county; also 372 Otto-Hoffman coke ovens at Franklin. It also owns all the stock of the Penn Iron Mining Co, operating iron ore mines in the Menominee range in Michigan; over 99 per cent of the stock of the Republic Iron Co., which operates the Republic mine at Republic, Mich., and one-half of the stock of the Mahoning Ore & Steel Co., which operates the Mahoning mine in the Mesabi range in Minnesota. It also owns a controlling interest in the Juniata Limestone Co., Ltd., which operates limestone quarries at Carlim, Blair county, Pa., and owns and operates the Naginey Limestone quarries in Mifflin county, Pa.

The Brown-Cochrane Co., Lorain, O., manufacturer of Brown gas engines, gasoline motors and CO_2 refrigerating machinery, has appointed William M. Maxwell general sales manager. Mr. Maxwell was formerly the company's manager at Des Moines, Ia., where he is succeeded by J. C. Compton. President J. O. Brown, who has heretofore had charge of the sales department, will, in the future, devote himself exclusively to the executive affairs of the company. It is proposed to establish additional branch houses and materially increase the company's business in foreign markets. C. J. Longenecker has been appointed chief engineer of the Brown-Cochrane Co. Messrs. Brown and Longenecker will collaborate in the production of a gasoline traction engine and gasoline hoist, both of which will soon be placed on the market.

Furnace B of the Northwestern Iron Co., Mayville, Wis., was blown out April 8.

WM. A. ROGERS*

The life of William A. Rogers, pig iron merchant and manufacturer, senior member of the firm of Rogers, Brown & Co., an officer in numerous producing and mining companies, and now one of the directors of the American Iron and Steel Institute, exemplifies strikingly how the comparatively short business career of one man can be taken as spanning that period which covers nearly all the important happenings that have contributed to the supremacy of the United States in iron and steel.

WM. A. ROGERS,
Director American Iron and Steel Institute.

Born in 1851 of New England parentage, Mr. Rogers for nearly 40 years called Cincinnati his home. He was valedictorian of his class at the Chickering Classical Institute of that city and on graduating entered the scientific department of Yale, where he received the degree of Ph. B. in 1874. In the fall of that year, he entered the office of L. R. Hull & Co., Cincinnati, an invoice clerk, and three years later was admitted to a junior partnership. Some time after the death of Mr. Hull, in 1880, the house of Rogers, Brown & Co. was formed, consisting at first of William A. Rogers and Archer Brown. It has since been enlarged by taking in other partners, there being at present seven members. While the headquarters still remain at Cincinnati, branches have been established at St. Louis,

*Fourth of a series of brief biographical sketches of officers and directors of the American Iron and Steel Institute. The first of the series was Elbert H. Gary, April 16, the second, Willis L. King, April 23, and the third, John A. Topping, May 7.

Chicago, Cleveland, Pittsburg, Buffalo, Boston, New York, Philadelphia, and Birmingham, Ala., which are presided over by resident partners or managers. The firm makes a specialty of foundry and forge iron. It is actively interested in 24 blast furnaces in various parts of the country and sells the products of nearly as many more.

In addition to being the senior member of Rogers, Brown & Co., which is a mercantile firm dealing in pig iron, separate and distinct from the several corporations which own the furnaces operated under the supervision of its members, Mr. Rogers is president of the Buffalo & Susquehanna Iron Co., with two furnaces at Buffalo; president of the Tonawanda Iron & Steel Co., with two furnaces at North Tonawanda, N. Y.; president of the Punxsutawney Iron Co., with one furnace in Western Pennsylvania; vice president of the Iroquois Iron Co., with two furnaces at South Chicago; director of the Cleveland Furnace Co.; president of the Niagara Iron Mining Co. and the Munro Iron Mining Co. of Michigan; and the Rogers Iron Mining Co. of Minnesota; vice president of the Cascade Coal & Coke Co. and the Buffalo & Susquehanna Steamship Co.

In 1890 Mr. Rogers moved to Buffalo to take charge of the Tonawanda Iron & Steel Co., of which he had been elected president, and the Buffalo branch office of Rogers, Brown & Co., which carried with it a general oversight of the manufacturing side of the firm's business as it then existed. At Buffalo he has been an active factor in the development of the iron and steel business of that city and in furthering the interests of the Niagara frontier. He is a director of the Marine National and the Erie County Savings Banks of Buffalo; vice president of the Buffalo Fine Arts Academy; elder in the Presbyterian church, and his interest in young men has made him an active promoter of the Y. M. C. A. He has taken a prominent part in the efforts made to extend Buffalo's harbor facilities and to secure an enlargement of the Erie canal.

Always a hard worker, he is a master of detail. His favorite recreation is golf. His hobby is gardening. To indulge this latter taste he is at present developing a large estate on the coast of Maine.

Mr. Rogers is an optimist as to the future of iron and steel in America. In spite of the tremendous advances which have been made in the last 25 years, he prophesies equally great strides in the future, believing that the exploited resources of the United States, which the population of the great west will bring within the realm of profitable development, will afford as marvellous advances as have been seen in the past.

Thirty Years' Progress.

On the occasion of a recent anniversary of the firm of Rogers, Brown & Co., Mr. Rogers described for THE IRON TRADE REVIEW the changes which have taken place in the business since his connection with it. He wrote substantially as follows:

"Thirty years ago, Bessemer steel manufacture was in its infancy here and the puddler, perspiring at every pore, toiled to bring from his furnace little balls of metal, which, assembled in the form of muck bar, were reheated and rolled into rails of iron. This period has witnessed the rise and culmination of the whole coke iron industry of the south, which has been such a large factor in the foundry iron trade and now is becoming one in steel. At the beginning of this period, the monthly publication of prices by the Thomas Iron Co. seemed to fix the market for the whole eastern field, and the Hanging Rock charcoal iron of Southern Ohio, brought down the river in boats to Cincinnati and St. Louis for distribution, dominated the western field and was the standard in Chicago and Milwaukee. This period has witnessed the stupendous development of iron ore production in the Lake Superior district and of transportation on the great lakes. Then what are now called the 'old ranges' of Northern Michigan and Wisconsin were being discovered and made known to the world. The Mesabi deposits, unequalled in the knowledge of man, were undreamed of. The whole quantity of ore shipped from the Lake Superior region prior to 1880 was less than half of what is now brought down in a single season. The 1,000-ton wooden sailing vessel was then a large carrier, which unloaded at destination by lifting the ore by horsepower from the hold into wheelbarrows which were trundled ashore by men. Today stately steel steamships, carrying cargoes of over 10,000 tons, unload it all in four hours by the medium of machines, each of which grabs and lifts 10 tons at a stroke. During this period of 30 years, the world has passed from the age of iron to the age of steel, and the United States, from being one of the last in the line, has forged ahead of all other nations in the production of both."

LARGE EXTENSIONS

To Heindel Mfg. Co.'s Plant Made Imperative by Expanding Business.

The Heindel Mfg. Co., whose works are at Hanover, Pa., has recently become incorporated under the laws of New York state with an increased capitalization, for the purpose of largely extending its capacity and field of operations. A new steel and masonry building is nearing completion, 95 x 430 feet. Of this, 150 feet is an addition to the foundry department; 30 feet will be used as a castings cleaning shop, and the remaining 250 feet is an addition to the machine-shop. The Avram-Leet Engineering Co. of New York are the engineers for this work, and the building operations are being carried on by the Bliss-Griffiths Construction Co., also of New York. The capacity of the foundry when completed will be 30 to 40 tons per day, and provision has been made for pouring single castings weighing up to 10 tons. Extensive machine-shop equipment, including an electric traveling crane, has been added, and facilities provided for handling all classes of machine work.

The regular product of the shops will be looms for making wire cloth, and machinery for making composite stone brick under the patents of the Avram-Leet Engineering Co. In addition to this standard product, the company is prepared to handle all kinds of jobbing orders. It recently secured the contract for all the iron castings to be used in the new Manhattan bridge over the East river, and some large orders for castings from the Interborough Rapid Transit Co. and from other large concerns requiring regular supplies of castings or machine parts from month to month.

The company possesses exceptional facilities, which include favorable labor conditions, proximity to the supplies of iron and fuel, and location between two lines of railroads, the Pennsylvania and the Western Maryland, with sidings from each one entering the plant.

The *London Commercial Intelligence* states that the world's demand for iron goods increases more rapidly than its demand for any other commodity. For the last 25 years the world's per capita consumption of iron has increased about 250 per cent. During that time the United States increased its output by about 400 per cent, and Germany by nearly 300 per cent.

MODERN ORE HANDLING MACHINERY.---I.

By Walter G. Stephan.[1]

Machinery designed to unload iron ore is attracting the attention of all who are interested in the manufacture of iron and steel at the present time because of its bearing upon the cost of both of these products. The cost of unloading from lake boats has been one of the important items which entered into the price of iron ore delivered at the furnace.

How great the percentage of reduction in the cost of unloading ore has been since the introduction of improved machinery is a matter of a very few words. About 20 years ago, it cost anywhere from 30 to 50 cents per ton to unload iron ore by the primitive method of shovels, wheelbarrows and tubs which were hoisted out of the hold of the vessel by means of a cable and horse.

The introduction of the first Brown unloading bridges, the pioneers in this field, reduced this cost to about 18 cents per ton while some modern plants installed within the last five years have brought this figure below 5 cents per ton. Inasmuch as it requires approximately two tons of iron ore to make one ton of iron, the effect of this reduced cost of unloading is a reduction in the cost of iron of from 50 cents to $1 per ton. In addition to this, it must be borne in mind that the improved unloading facilities permit the ore fleet to make many more trips per season than formerly, a factor which is certainly not to be considered unimportant.

Where formerly it took a week to unload a cargo, it now takes on an average from 5 to 10 hours. On account of the shortness of the season of navigation on the great lakes, and the great tonnage required to be delivered by the ore fleet in the seven open months, it is important that as little time as possible be consumed in the actual work of unloading. Unwarranted delay at the dock, because of repairs to the unloading plant, is a source of great moral upheaval on the part of the otherwise genial lake captain.

Again the saving of only one cent at some of our modern docks where from 1,000,000 to 4,000,000 tons of ore are unloaded in one season amounts to from $10,000 to $40,000 per season.

The Hulett Electric Ore Unloader.

In Fig. 1 is illustrated one of the two new electric ore unloaders which were installed at the docks of the National Tube Co., Lorain, O., in the spring of 1907. These unloaders are larger than the old machines (one of which is shown in the background) but are built along the same general lines.

There are several features about these docks which offered complications materially affecting the design of this plant. First, the dock itself is located on a concave bend in the river of about 1,200 foot radius. Second, the tube company's plant is located on the level of the top of a high bank—making it necessary for the unloaders to lift the ore about 60 feet in unloading. The greater part of the bench on which the machines rest was cut from the natural bank, cribbing being built out to support the railroad tracks and the front legs of the unloaders.

The bucket is attached to the foot of a built-up steel leg and has a ca-

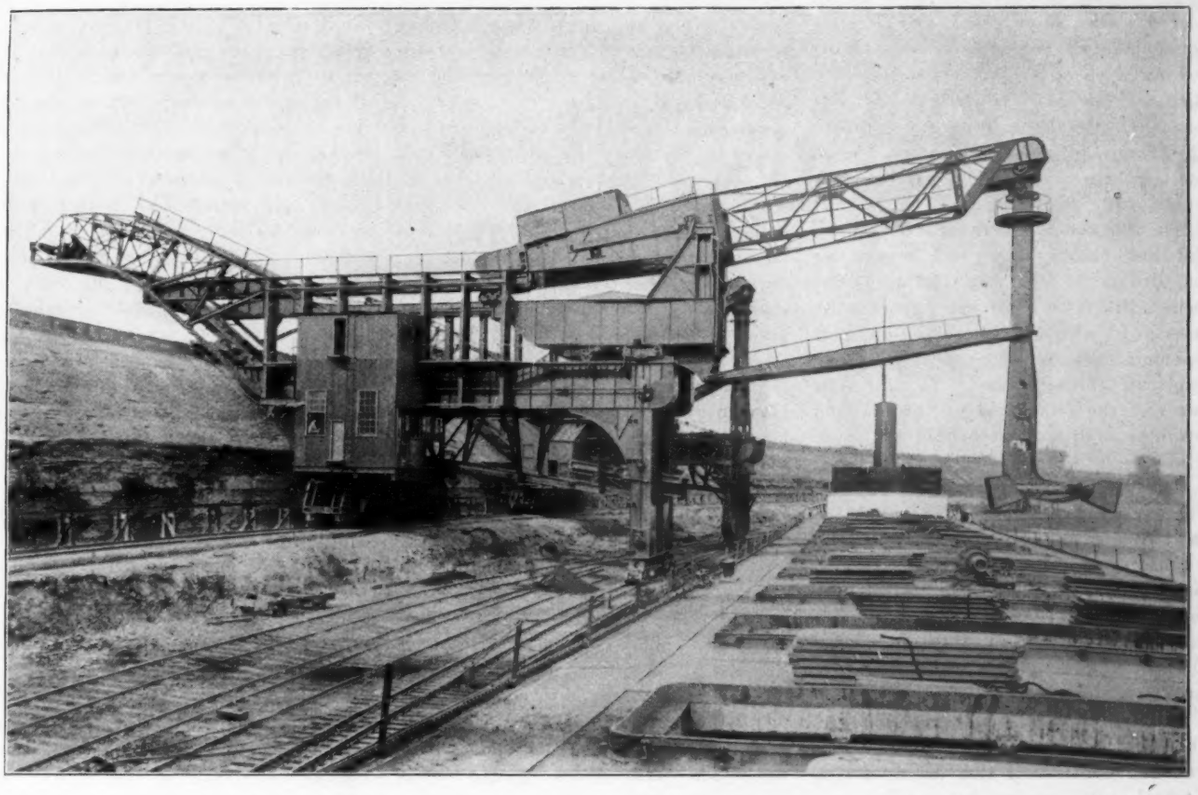


Fig. 1—Hulett Electric Ore Unloaders, National Tube Co., Lorain, O.

[1]Consulting Mechanical Engineer, Citizens building, Cleveland.

pacity of 10 tons. This bucket leg is held in a swivel supported by trunnions at the water end of a huge walking beam. It is held in a vertical position throughout its entire path by means of a parallel arm pivoted below on the trolley and fastened to trunnions in a swivel ring on the leg. By means of cables and sheaves located at the top, the leg can be rotated through an arc of 320 degrees so as to allow the bucket to work at any angle in the hatch of a boat. The bucket is operated by a man located in and traveling with the lower end of the leg. It has not only the movements of opening and closing its jaws but one scoop can be telescoped so as to reach out a distance of 15 feet 4 inches from the center line of rotation of the leg—this movement allowing it to cover more than half the distance between the hatches of any boat and thus unload 90 per cent of the cargo of an ordinary ore boat, and in the case of some modern boats, fully 97 per cent.

The bucket is operated directly by flat link chains which are wound up on drums in the leg, these drums being driven through spur gearing by means of two steel cables, one for opening and one for closing, which lead up through the center of the leg and the front end of the walking beam to a drum just behind the pivot pin.

The walking beam is pivoted at the center, the pivot pin being supported in two bearings resting on the uprights of the trolley frame. It is balanced by means of the machinery and cast iron counterweights at the rear end, so as not to allow more than just enough pressure on the bucket scoops to dig 10 tons of ore.

The hoist for raising and lowering the beam is located at its extreme rear end and consists of two drums driven through spur gearing by a 150 horsepower Westinghouse mill type motor. Two cables lead from each drum over double grooved sheaves anchored at either side of the rear end of the trolley frame, the return cables being anchored to the rear of the walking beam.

The trolley is carried on two heavy equalized front trucks which travel back and forth on the main girders of the machine, at right angles to the dock. This movement is accomplished by means of two pinions and racks, one on each girder—the pinions being driven through spur gearing by a 75 horsepower Westinghouse railway motor.

On account of the forward position of the walking beam pivot with respect to the front trucks, the rear of the trolley is provided with two inverted equalized trucks which travel on an inverted track supported from the girders below. Automatic stops and electric cutouts are provided so as to prevent accidents from over travel in either direction—these being entirely independent of the operator. All the movements of the trolley, walking beam and bucket leg are controlled by the operator in the leg through master controllers. The oscillating motion of the walking beam is provided with automatic cut outs and a mechanical safety latch which will hold the beam in case of extreme over travel. These safety latches are very similar to the ordinary door latch. All of the operating machinery is provided with solenoid brakes which set as soon as the current is cut out.

The main girders rest upon heavy yokes at the front and rear, and span two standard gage tracks underneath. The rear yoke rests on two nests of rollers which run on curved tracks fastened to the rear truck girder underneath. The tracks are curved so that the entire machine may be swung about a pivot on the center line between the front trucks. This swinging is necessary on account of the curvature of the dock. When the large ore boats are tied up for unloading the side of the boat amidships is about 12 feet from the dock. So in order to "square the machines to the hatches" it is necessary to provide for a swinging motion of the entire machine. This is accomplished by means of several steel cables which are anchored to either end of the rear yoke and which are wound on and off a drum on the rear truck girder, driven through a worm and worm wheel by a 50 horsepower motor. The rear truck girder is of heavy construction and is ingeniously designed to equalize the unusually heavy loads on the rear trucks. There are 24 wheels under this girder traveling on two curved tracks. These wheels are ground to different diameters to allow for the curvature of the dock and eight of them are driven through spur and bevel gearing from the machinery house above. This drive is accomplished by the use of a square pinion shaft running between the driving trucks on which slides a spur gear held in a frame under the house which can adjust itself to the varying positions of the shaft due to the swinging of the machine. A second gear is held in mesh with the first in the frame and it is driven through universal couplings and bevel gears from the machinery house above.

The front yoke of the unloader rests upon two conical rollers one on each side mounted in bearings on the center of the truck beam. Each truck has eight wheels—all equalized and four of them driven through bevel gears from the machinery house as shown in the cut. The drive is accomplished through the pivot casting on the center line of the front yoke, which also forms the pivot about which the machine swings.

Two rails riveted to I-beam stringers between the main girders form the track for the bucket car, which is a large double hopper car holding somewhat more ore than the grab bucket can dig. The track is bent to a reverse curve extending from the face of the machine to the end of the cantilever which projects out on the land side to support it. The object of the bucket car is to shorten the travel of the bucket in and out of the hold so as to save time. The bucket dumps its load into the car and while it is returning for another, the car is hoisted to the top of the incline and dumped—returning in time to receive the next load. A complete cycle can easily be made in less than one minute. This car can be dumped automatically either at the top of the cantilever into the concrete trough below or into railroad cars on either track at the dock level. The bucket car is hoisted by cables running up the incline and back to the drum in the machinery house, and returns by gravity. A novel safety device has been provided for the bucket car, in case the cables should break, in the shape of two cast steel racks, one on each side of the track rails. Large cast steel pawls are fastened to the side of the car, which engage the teeth of the racks when the car ascends loaded, and which are automatically raised from them when the doors of the car are opened and the load is dumped for the return trip. This safety device has been tested on several occasions and has never failed to operate successfully.

The car haulage drum is located in the machinery house and is geared to a 200 horsepower specially designed Westinghouse mill type motor—the largest motor of its kind and type even built. The ore is rehandled from the concrete trough at the top of the bank to the stock pile or furnace by a Hoover & Mason bridge operating a 15-ton grab-bucket. The bottom of the trough is lined with steel rails

upon which the bucket shells dip.

The speed of travel of the Hulett unloader along the dock is over 75 feet per minute and its total weight is about 850 tons. The bucket has a capacity of 10 tons and a maximum spread of 19 feet 6 inches when telescoped. Its maximum reach is 65 feet from the face of the dock, which provides for larger boats than are now built.

Current is supplied to the four unloaders at this plant by two T-rails conductors running parallel with the tracks behind the rear girders. Cast iron shoes bearing upon the heads of the rails take off the current, from which point it is wired to the various motors and controllers. A similar system of rail conductors and shoes carries current to the trolley from the main girders. All the castings on the unloaders are of steel excepting the counterweights and a few small details.

One of these machines will average 500 tons per hour in unloading the first half of a cargo and the record for the four machines at this dock—two new and two old—is over 532,000 gross tons in one month.

On Oct. 23, 1907, these four machines unloaded 10,092 gross tons of ore from the steamer J. C. Wallace in 6 hours and 24 minutes, working 22 men in the hold for about one-quarter of the time. This is an average of 394 tons per hour, which is said to be the best record made on the great lakes for speed.

To operate one of these unloaders requires an operator in the bucket leg, an operator in the machinery house to handle the car and move the machine, an oiler and about five men in the hold for one quarter of the working time, to clean up.

A Hulett Ore Handling Bridge.

The immense stock of ore which has to be stored on the docks for furnace plants in order to supply the furnaces with material during the winter months, has brought about the design of huge ore bridges which span the stock piles and which operate an automatic self-filling bucket used for storing the ore and also for reclaiming it when it is wanted for immediate use.

An excellent example of the modern ore bridge is shown in Fig. 2. This was installed at the docks of the Wheeling & Lake Erie railroad, at Huron, O., in 1907. It is used in conjunction with the four direct unloaders which were built some time previous by the Wellman-Seaver-Morgan Co. The main span of the bridge is 285 feet with an 85-foot cantilever on the tower end and a 45-foot cantilever on the shear leg end—making a total of 415 feet over all. The maximum travel of the bucket is 397 feet. The bucket is a 10-ton Hulett excavating bucket opening at right angles to the length of the bridge, and it is handled from a simple four-sheave trolley running on tracks suspended below the floor beams of the bridge in the usual manner. The bridge proper is made up of two riveted Pratt trusses 14 feet centers, supported on a pivot at the tower and hung from the shear leg on eye bars. The shear leg is laid out in very graceful lines and offers an unusually large open space for bucket clearance—an item which is a very important consideration. It rests on two four-wheel trucks 50 feet apart with ball and socket joints—both trucks being driven by means of gearing and shafting which extends up both sides of the leg and connects with a cross shaft on the bridge, through universal couplings. From this cross shaft a driving shaft extends along the far side of the bridge to the tower and thence down in the same manner to the machinery house below. The flexible shaft connections are provided so as to allow for the skewing of the entire machine in case of misalignment

FIG. 2—HULETT ORE UNLOADING BRIDGE, WHEELING & LAKE ERIE RAILROAD, HURON, O.

or in case it is desired in the regular operation of the bridge.

The tower supports the bridge on a heavy cross girder which in turn is supported on A-frames extending to the trucks below. The machinery house is placed to one side of the supporting frames and is large enough to cover the hoist engine, trolley engine, boiler and fuel supply. The entire tower is supported on six four-wheel trucks, two of them idlers and four of them driven from the main hoist engine. These trucks are provided with ball and socket joints or with expansion bearings to allow for a variation in the gage of the tower tracks which are 32 feet center to center. The tower spans two standard gage railroad tracks for cars, which are loaded through hoppers supported in the tower frame above. A noteworthy feature of this tower is the liberal clearance allowed for the bucket—it offers no obstructions which must be carefully avoided by the operator and which would cut down the speed of operation. The operator is located in a house high up on the tower frame, a position which gives him a clear view of all the movements of bucket and bridge, even when the stock pile is at its maximum height. His eyes are in a plane a few feet below the level of the trolley track stringers.

The operating mechanism in the house was purposely designed to be operated by either one or two men as desired. Long double tension wires connect the operator's levers with the operating shafts below.

The machinery house covers the main hoist engine which is a 16 x 20-inch double drum geared hoist, the trolley engine, which is an 11 x 15-inch direct-connected hoist, and a 200-horsepower modified type of marine boiler. A coal bunker inside is provided with a separate drum hoist and derrick for raising coal in tubs from cars underneath.

The speed of travel of the bridge along the dock is about 75 feet per minute—the trolley speed is 1,000 feet per minute, and the hoisting speed, 225 feet per minute.

The bucket will handle 12 tons of some kinds of ore, and the maximum capacity of the bridge is 500 tons per hour. All the castings on the bridge are of steel, annealed so as to reduce internal strains to a minimum.

The ore stock pile underneath the bridge has a capacity of 700 gross tons per lineal foot. The entire bridge is operated by two men—one operator in the operator's house and one engineer and fireman in the machinery house.

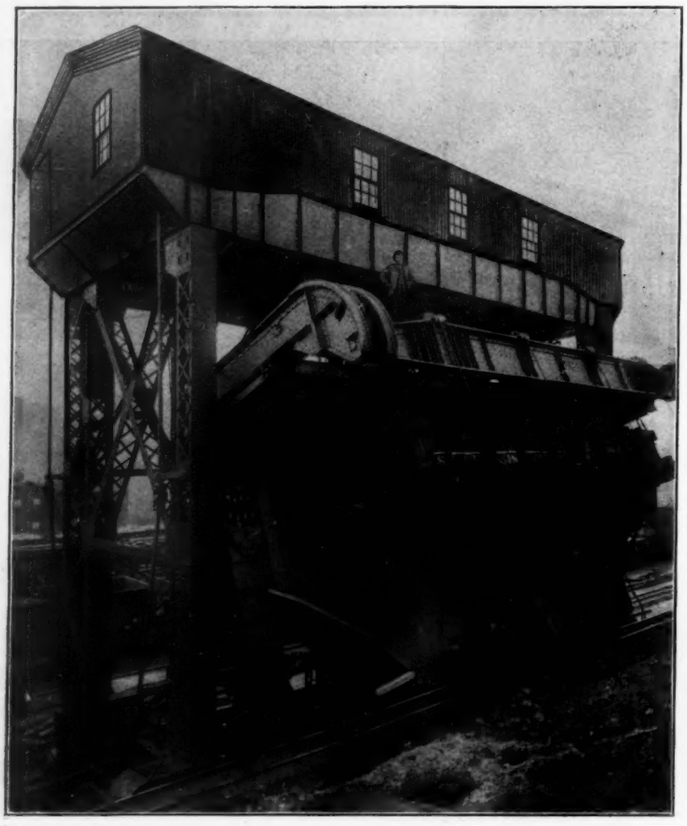


FIG. 3—HULETT MOVABLE CAR DUMPER, NATIONAL TUBE CO., MCKEESPORT, PA.

Hulett Movable Ore Car Dumper.

The idea of a machine built to dump an entire car load of ore at once is not a new one today, but the idea of a car dumper which is itself movable and which will perform this unloading feat anywhere along its track is quite new. The illustration, Fig. 3, shows the second movable car dumper which has ever been built, the first one being in successful operation at the works of the Cambria Steel Co. It was designed by the Wellman-Seaver-Morgan Co. and installed at the National Tube Co.'s plant at McKeesport, Pa. It has a capacity of 175 cars per day and is built to handle railroad cars of 150,000 pounds capacity; that is, larger than any cars now built, as well as the smallest cars now in use.

The reason for building a movable car dumper is to do away with one handling of the ore. It has been the practice in the past, in similar cases, to dump the car into small transfer cars which were hauled to the ore bridge and thence over the stock pile to be dumped. With the movable dumper the ore is dumped into a V-shaped trough of concrete, at any point along its length, and from there the bucket, swung from an ore bridge, reclaims it and stores it in the stock yard.

The car dumper shown dumps the ore over a 10-foot wall into a concrete trough. The dumper consists of a rigid rectangular steel frame mounted on four front and two rear trucks. All of the trucks have four wheels and are provided with ball and socket joints. Two expansion bearings are provided on the rear trucks to provide for any change in the gage of the tracks. A feature in connection with the design of this machine is the fact that it is used on a grade of 1¼ per cent, which makes it necessary to use fillers of varying width under the trucks. Two of the front trucks are driven and two are idlers. Both rear trucks are driven. Four corner posts are supported on the front and rear truck girders, which extend to, and support, the machinery floor at the top. These posts are braced in three planes only. A heavy built-up cradle of L-shape is pivoted on two 9-inch pins anchored half way up on the center line of the front posts, and it is rotated about these pivot pins as centers by means of eight heavy cables which wind about it like an irregular shaped drum and are finally fastened to a pair of drums located on either side of the machinery house on top.

On the floor of the cradle is a platform called a platen which carries the rails for the cars and which is automatically moved sideways on rollers so as to rest the sides of the car against the cradle in dumping. This movement is necessary because the car dumper must be made to handle cars of any width or height. Four automatic clamp beams are provided which are operated by a series of counterweights at the rear, and by a cam motion anchored to the front truck girder. After the car is run on to the platen the hoisting drums above are rotated and the hoist cables are wound in, thus turning over the cradle and car. As this turning progresses the platen is first automatically moved over by springs until the car body is against the side of the cradle and then the four clamp beams gradually descend until they rest upon the top of the car, holding it firmly in place while dumping. On the return movement of the cradle the clamps are automatically raised off the car, so that no attention need be paid to clamping the car after it is on the cradle. Two independent sets of counterweights are provided which are designed to help the cradle hoist in lifting the car in its first motion and also to help to hold the cradle and car when they are turned over. The cradle is designed to handle cars up to 50 feet in length and from 5 feet 9 inches to 12 feet 6 inches in height.

The approach track to the car dumper is on an incline and is made of steel castings which are so designed that they line up with the standard gage track for the cars. They are so made that there is very little jar when the car wheel enters the incline, the incline castings being so made that the load is first taken by the flange of the wheel and then gradually delivered to the tread as the car rides up the slope. The speed of travel of the entire dumper along the tracks is 100 feet per minute.

The machinery house above contains the cradle hoist and the moving motor and shafting. The cradle hoist consists of two drums geared through spur gearing to two 150-horsepower mill type Crocker-Wheeler motors in series. The moving motor is a 75-horsepower Crocker-Wheeler motor and drives all four driving trucks through one line of shafting running the entire length of the machinery floor.

The operator's house is located on the front post on the far side of the machine. He stands facing the car dumper and the approaching car. All of the movements of the machine are under his control. The controllers are of the magnetic switch type with master controllers in the operator's house similar to those in the ordinary elevator. If he wishes, the operator can sit down while handling his levers. Solenoid brakes are provided for all the movements and a special emergency foot brake lever is within easy reach. The lowering is done by reversing switches in the controller, which make the motors act as generators and retarders, thus giving perfect control without the use of mechanical devices. Electric cut-outs are installed which are independent of the operator and which prevent over travel of the cradle in either direction.

The total weight of the car dumper is 780,000 pounds. Except for a few minor castings, counterweights, etc., everything is steel. Fire-proof construction is used throughout. The machine has been so successful in operation that another one is being built at Youngstown for the Youngstown Sheet & Tube Co.

ELECTRIC POWER IN IRON AND STEEL MILLS[1]

By W. Edgar Reed.[2]

The increasing application of electric drive in iron and steel works is due partly to the economy in transmission and distribution, partly to its reliability and partly to the ease and facility of control. Electricity offers also, in many cases, the most efficient and elastic system of power transmission. It requires simply a few properly insulated wires for the transmission of great quantities of power for long distances and with a small percentage of loss. A part or all of the load can be easily and quickly changed, cut off or thrown on without injury to the system. These features permit the centralization of the smaller generating stations required by other systems, the averaging of the intermittent and varying loads and effect a generally increased production. This means a great reduction in the cost of power and in the capacity of the stations. Generally a central power house need only have from 25 to 33 per cent of the combined capacity of the auxiliary motors.

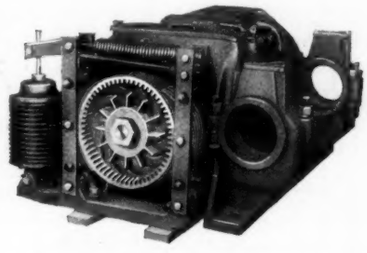


Fig. 1—Motor and Electrically Operated Brake.

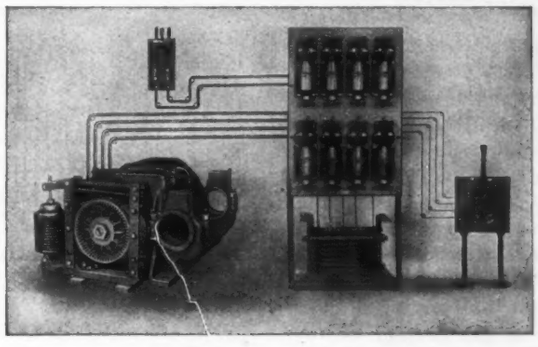


Fig. 2—Mill Motor, With Brake Operated by Motor Controller, and Magnetically Operated Switches.

Heavy mill work requires a drive capable of withstanding intermittent excessive loads and, in order to reduce the cost of repairs to a minimum, requires a very flexible coupling between the prime mover and the rolls. Electricity offers the most flexible connection known and is the system best suited where excessive variations in power are required. These advantages are so well understood and the system has been so thoroughly tried that there is no hesitation in using electric drive for all the auxiliary apparatus and for even the most severe and exacting conditions met in

[1]A paper read before the Engineers' Society of Western Pennsylvania, March 17, 1908.
[2]Consulting electrical engineer, Pittsburg.

large continuous or reversing roll work. The waste gases from blast furnaces offer a comparatively cheap source of power when used in connection with an electrical installation, and are utilized for this purpose where the cost of fuel is comparatively high; and even in the United States where coal is very cheap, the use of blast furnace gases for power purposes has been found advantageous. When power for a mill is bought from an outside company which also furnishes power for purposes requiring good voltage regulation, large fluctuating loads might be objectionable; the excessive intermittent loads common in mill work may be large compared with the capacity of the power station and seriously affect the voltage regulation, especially if motors be used for driving the main rolls. The maximum power required, although it may last for a short time only, determines the maximum size of the station and the cost of power; for this reason power is often sold on the basis of the maximum instead of the average or total power consumed. It is, therefore, desirable to reduce the maximum demands or peak loads as much as possible in order to secure improved regulation and to reduce the cost.

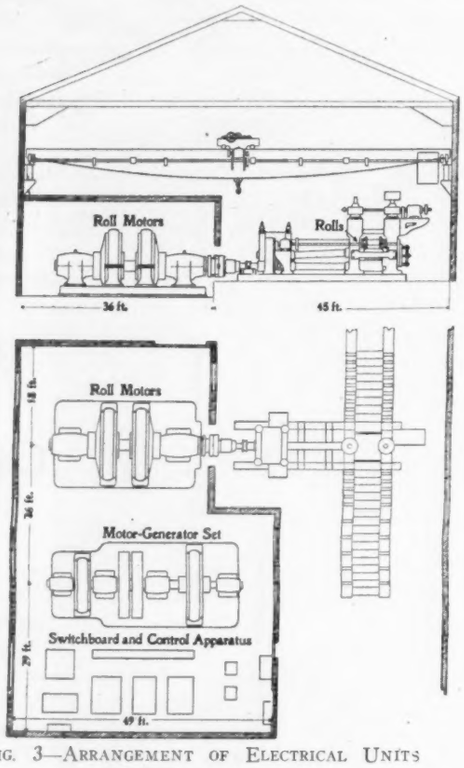


FIG. 3—ARRANGEMENT OF ELECTRICAL UNITS AND CONTROL.

Drive of Auxiliary Apparatus.

The first application of electric motors in steel mills was made about 1892, when they replaced steam-driven and other types of hoisting apparatus, and were also used for operating overhead cranes. The crane applications were of the greatest importance; no installation is considered modern without the electric crane, and no one who has had experience with it would think of replacing it by any other type.

The application of electric motors was next made to the operation of charging machines for open-hearth furnaces, and to machinery for the handling of blooms and slabs. Electric motors have also been used extensively for the operation of roller tables where ease of operation and time required in handling material is of the greatest importance. The application of the motor has also been extended to screwing down rolls of bloom, slab, plate and other mills; lifting and rotating blast furnace bells; tipping Bessemer converters; operating transfer tables, saws, shears, bending and straightening rolls, blast furnace hoists, ore and coal conveyors, and all the auxiliary apparatus in iron and steel mills. In a few instances motors have been used for operating blowers for Bessemer converters, but often blast furnace gases are used directly in gas engine driven blowers. For the purposes mentioned, either the direct or alternatitng-current variable-speed types of motors are universally used. This type of motor is suitable for developing variable speed at variable torque, and is applicable where frequent starting and reversing with large torque are required. Less energy is required to perform these operations with this type of motor than with other types.

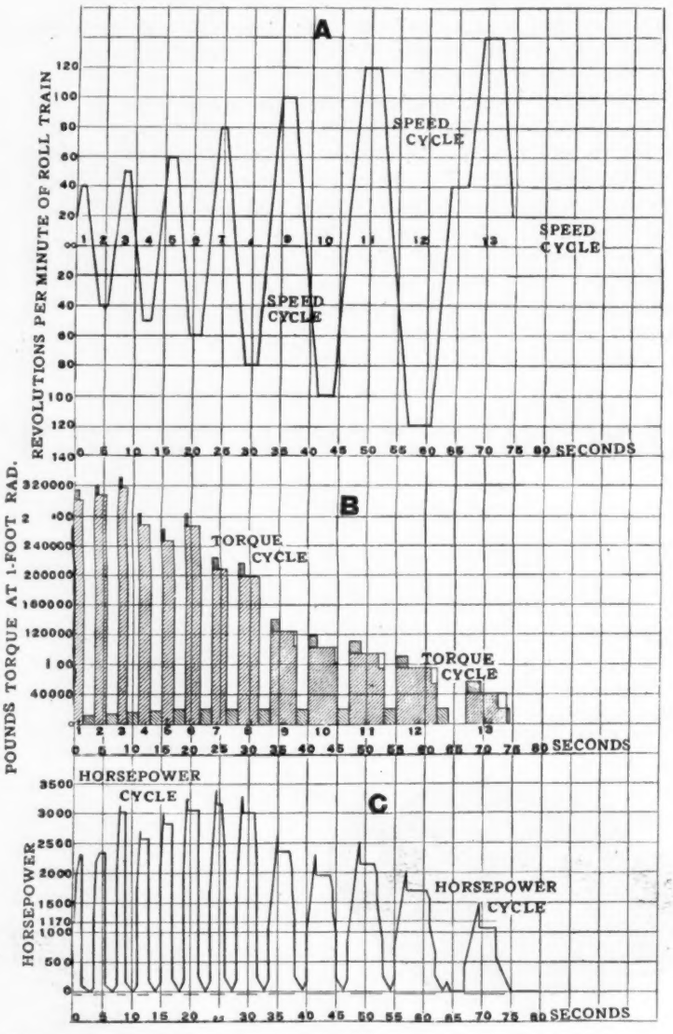


FIG. 4—SPEED, TORQUE AND HORSEPOWER CURVES, SHOWING REQUIREMENTS OF 30-INCH REVERSIBLE MILL.

For the operation of continuous rolls, saws, cross and straightening rolls, punches, shears, etc., where

fairly heavy starting torque and continuous operation in one direction are required, and at the same time where the load may be greatly diminished or taken off the motor entirely, the compound type alternating or direct-current motor is generally used. In work with varying torque, this type gives less variation in speed than the variable-speed motor, and the maximum speed is limited to a suitable safe value at small loads.

The first motors to be put in general use for the classes of work mentioned above, were of the street railway type, suitably modified mechanically for mounting on foundations, cranes and machines, and in some cases, with changes in the windings. Later designs, however, have been changed greatly and have been made heavier and stronger to better meet the conditions of mill work.

Motors for intermittent mill work require a design quite different from that used in any other class of service. They are not only subjected to heavy intermittent duty, large starting and accelerating torques, and shocks due to sudden variations of load, but they must also withstand rapid and continued reversals. Some of the features of up-to-date direct-current mill motors are as follows: Strong cast steel horizontally-split frames provided with heavy wide-spread feet; the upper frame should be hinged to the lower one and the connections so designed that the motor can be easily opened and armature removed without changing electrical connections; axle-bearing housings, when required, should be cast with and form part of the lower frame; large mechanical clearance between armature and fields should be provided; the armature bearings should be split, interchangeable, dust proof and provided with eyebolts for handling the armature; provision should be made for either grease or oil lubrication; shafts should be extra large compared with those used in railway service and the armature should be built upon a spider so that shafts can easily be replaced; the insulation should be as nearly fireproof as possible, and capable of withstanding the high temperature to which it may be subjected, due to its own heating and the high temperature of surroundings; the motor should be enclosed and provided with tapered shaft extensions on both ends for brake and pinion fits.

Mill motors are generally rated on the ½ hour full load 40 degrees Cent. temperature rise basis. For given applications they should be chosen by determining the average losses for a cycle of operations, and comparing these with the losses different motors will stand with a satisfactory increase in temperature.

The maximum temperature is one of the elements which limit motor capacity, and the temperature of the place where the motor is installed must be carefully considered; in making these comparisons the maximum torque, etc., required at any time must be considered. A voltage of 220 has been used more often than any other and may almost be considered a standard; the danger of a shock from grounding a 500-volt circuit has generally been a strong argument against this higher voltage. These general features can be applied to alternating-current motors. The split frame is very seldom used with these motors, however, and the brackets are made in such a way that they can easily be removed and the armature slid out of the frame along the direction of the shaft. In such a motor it is advisable to have split brackets, and the bearings should be separate from the brackets to give access to any part of the machine. The use of the electric drive to all the auxiliary apparatus in iron and steel mills, partly described above, has been gradually increasing since 1892. The drive of the main rolls has been a more difficult problem on account of the size of the units and character of the load, and such installations are only of comparatively recent date; they are, however, of great importance and interest and are attracting the attention of both engineers and manufacturers.

Drive of Main Rolls.

The excessive intermittent loads when the roll motor is large, as compared with the capacity of the generating station, may cause great fluctuation of the power house load unless an equalizer is used. For the auxiliary apparatus each motor is very small compared with the capacity of the generating station, and large variations in its load would have but little effect at the power house. This is particularly true when many of these motors are using energy from the same power house, because part of them would be operating at heavy loads when others are carrying light loads, the average load being fairly uniform. With main roll motors, however, this is not the case, and variations are so large that they may in some cases be troublesome to handle in an economic way without some kind of an equalizer. Some idea of the variations in torque and power required for operating main rolls may be obtained from Figs. 4 and 5. Fig. 4 shows the variations of speed, torque and horsepower for different passes and at different times during the operation of a reversible 30-inch plate mill. In choosing a motor for any particular installation, curves similar to these may be determined from indicator diagrams of existing similar steam engine driven installations. The rolling speed is determined from the number of passes required for given reductions in section, intervals between passes and the time required for acceleration with a given available power, speed of rolls when material enters and leaves

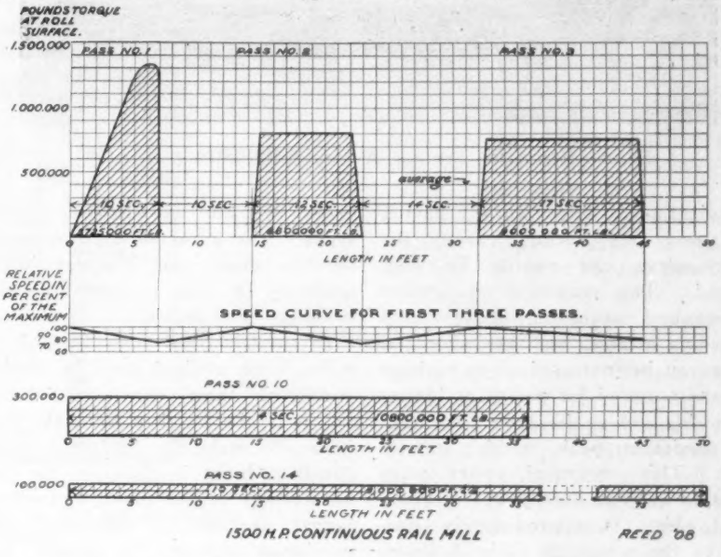


FIG. 5—VARIATIONS OF TORQUE, HORSEPOWER AND SPEED IN OPERATION OF 3-HIGH CONTINUOUS RAIL MILL.

them. The torques required at the roll surface for different passes or reductions of sections at certain temperatures, to overcome friction and to accelerate masses, are then determined; curves showing power required for elongating material are

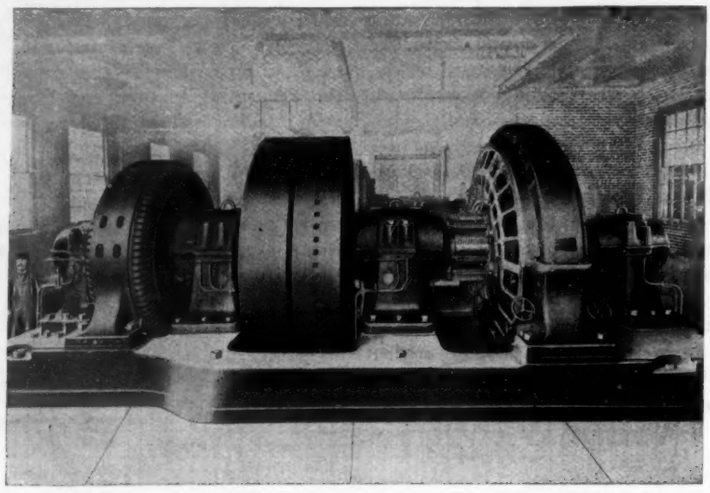


FIG. 6—EQUALIZER SET FOR 30-INCH UNIVERSAL MILL.

convenient in this work; having the speed and torque curves the power curve can readily be constructed. The reduction of section and required torque become less with succeeding passes, and the speed of rolling can be increased so as to keep the time required for passes as low as practicable and at the same time keep the maximum peak within suitable limits. This integrated power curve shows an average horsepower of about 1,200, which is approximately one-third of the maximum. Fig. 5 shows the variations of torque, horsepower, and speed in the operation of a 1,500-horsepower, three-high, continuous rail mill. The speed drops and kinetic energy is given out when material is being rolled, and, increasing to the normal between passes, stores up energy to repeat the cycle.

Steam-engine-driven reversible rolls operating at widely varying loads have low average efficiency; the simple non-condensing engines generally used, when operating at fairly constant loads, are not as efficient as other types. The repeated shocks on machinery, gears and bearings have a tendency to cause considerable wear, breakage and repair.

In the electrical operation of such mills, some method must be used for equalizing these excessive variations and peaks before they reach the power house, to make the load more nearly constant, bring it closer to the rated horsepower of the plant, and effect a higher average of efficiency, lower maximum capacity of power house apparatus, and lower cost for power. Opposing these advantages, however, there must be considered the extra cost of the equalizer set and controlling apparatus. If there are two or more main roll motors whose cycle of operations are not identical, or which cannot be operated at the same time, equalizer sets will be required for each motor.

Methods of Equalizing.

In continuous mills where the peak load is of short duration, the peaks and light loads can be changed to a fairly uniform value by increasing the kinetic energy of the rotating parts, which may be accomplished by increasing the weight of the rotating element or by placing a fly-wheel on the motor shaft. The speed of the mill motor must drop with the increasing load in order to utilize the stored energy in the rotating element.

The greater the fly-wheel effect, the greater will be the equalizing, with a consequent reduction in the overloads on the motor. By using a suitable fly-wheel design the overload on the motor can be any practical value desired.

Methods of Equalizing Reversing Mills.

The kinetic energy of reversing parts should be a minimum in order to obtain quick reversals and keep the energy loss to a low value. Fig. 4 shows an example of the frequency of such reversals, which requires an equalizer differing from that used with continuous mills.

One form of equalizer suitable for these requirements consists of a motor-generator fly-wheel set connected between the roll-driving motor and the source of power. The general arrangement and connections for such a set are shown in Fig. 9. This system has been found very efficient in equalizing the large variable and intermittent loads found in large reversing mills, and may also be used to good advantage in many small mills.

This equalizer set, shown in Fig. 8, consists of an induction motor with an external resistance in the secondary

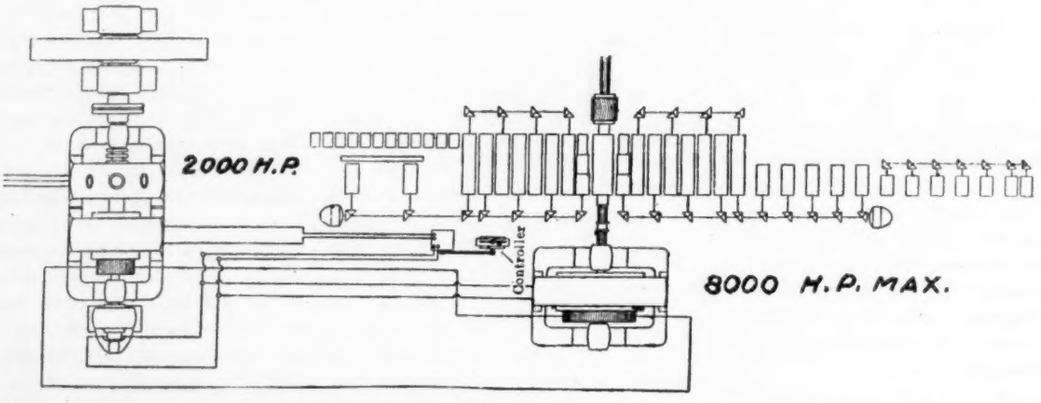


FIG. 7—EQUALIZER SET AND MILL MOTOR.

circuit, driving a fly-wheel and a direct-current generator. A direct-current motor having drooping speed characteristics could be used in place of the induction motor. The direct-current generator is electrically connected to the roll motor, the operation

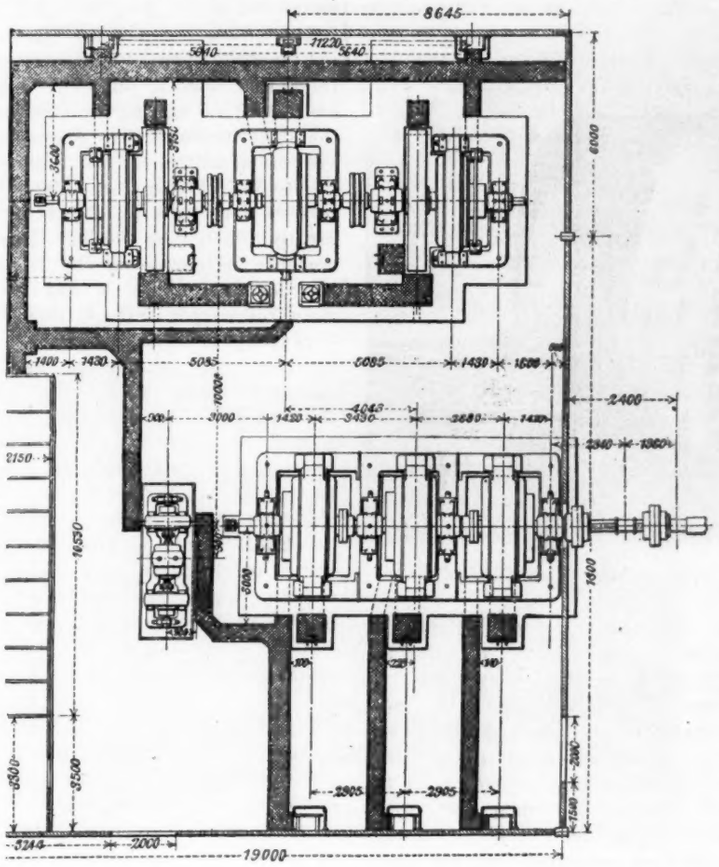


FIG. 9—GENERAL ARRANGEMENT OF EQUALIZER SET FOR REVERSING MILLS.
Dimensions in Millimeters.

of which is controlled by the simple and easy method of regulating or reversing the generator field current, which is small and of low voltage. In slowing down, the field of the generator is weakened and the roll motor reverses the current through the generator, thus tending to motorize the generator and act as a dynamic brake on the roll motor. Both motor and generator may have auxiliary poles to insure good commutation.

The alternating-current motor is of the wound-rotor type which permits the use of variable resistances in the rotor circuits and the use of a slip regulator for producing variable speed. By the use of this equalizing method a nearly constant supply of current may be taken from the line independent of the power being delivered by the roll motor. When the load comes on the direct-current generator, the fly-wheel gives up energy and supplies that portion of the power required in excess of the average. Under excessive overloads, the greater the reduction in speed, the greater will be the amount of energy given up by the fly-wheel, as the kinetic energy in the wheel is proportional to the square of its speed. This is accomplished by making the speed of the motor automatically adjustable by inserting resistance in the rotor winding and thus varying the slip.

Two relays are placed in the circuit which supplies the induction motor. These relays are arranged to change the secondary resistance of the rotor so that the motor may drop in speed as the load increases and prevent drawing a greater current from the line. Both relays are closed when starting or at light loads. As the speed increases, the resistance switches are closed by the rotor current, first one, then two, three, four, etc., until the current in the induction motor reaches the desired maximum, when the first relay opens the auxiliary circuit so that no more switches can close. When a heavy load comes on, the fly-wheel gives out energy and slows down allowing more current to be taken from the line. This causes the second relay to operate and cause the resistance switches to insert more resistance in proper order again. This adjustment forces the fly-wheel instead of the motor to take the greater part of the intermittent load by giving up part of the kinetic energy stored up before the overload came on. This equalizes the irregularities, gives a fairly constant load on the induction motor and all other apparatus back of it, and procures good line voltage regulation.

The slip required of these motors depends upon the value of the peak overload, its duration, and interval between peaks, as well as upon the fly-wheel effect of the rotating parts. It can generally be adjusted for values up to approximately 20 per cent; a motor having 16 per cent slip at full load would have approximately 24 per cent slip at 50 per cent overload. This 24 per cent decrease in speed would require the fly-wheel and all other rotating parts of the set to give up approximatey 42 per cent of their total kinetic energy; the speed decreases during the passes and increases between them.

Continuous Mill.

Among the many installations recently made is the following: Two 1,500-horsepower, compound-wound, 220-volt, 100 to 125-revolutions per minute, direct-current motors at the

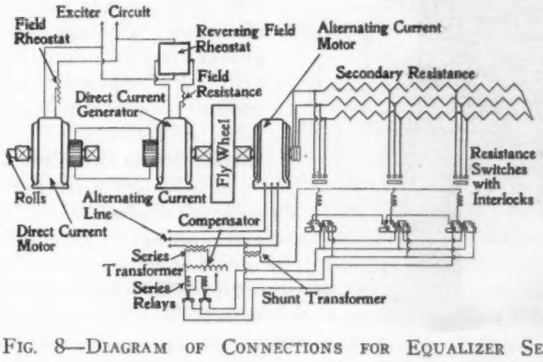


FIG. 8—DIAGRAM OF CONNECTIONS FOR EQUALIZER SET.

Edgar Thomson steel works for driving continuous rail mills. These motors are direct-connected to the rolls, and special attention has been given to mechanical design. The bearings are of the oil ring and forced circulation babbit-lined type, 25 inches diameter by 62 inches long, and are arranged for water-cooling. The motor is also very liberally designed and commutation is exceedingly good. A 125,000-pound cast steel segmental fly-wheel 18 feet diameter is mounted on the motor shaft to assist in equalizing the load on the motor and power house. The speed of the motor drops from approximately 125 to 90 revolutions per minute in actual operation, which allows the fly-wheel to take care of the peak loads.

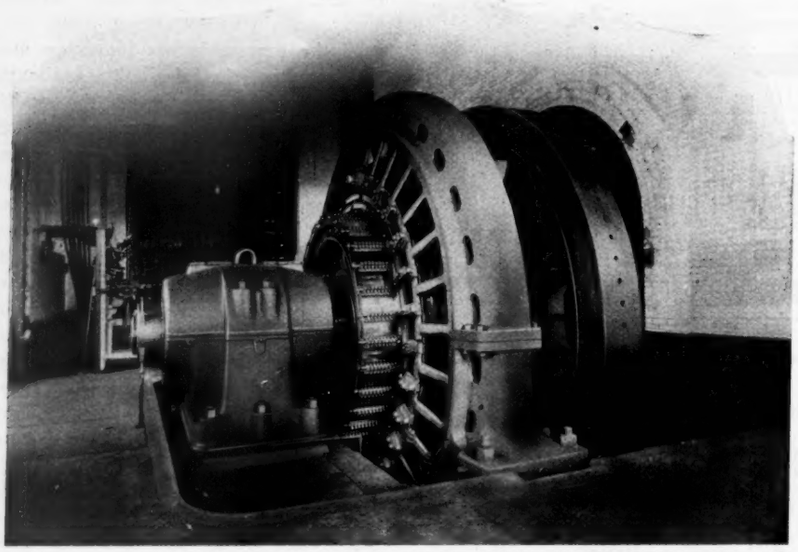


FIG. 10—DIRECT CURRENT MILL MOTOR.

Fig. 10. This illustration shows a direct-current mill motor with thrust collar on the housing next to the mill, to take thrust in case the mill shaft is broken. The motor is provided with water-jacketed bearings, and oil ring and gravity systems of lubrication. The starter for each motor consists of 10 large switches mechanically interlocked so that they must be thrown in proper order. All these switches can be tripped from one place, and are arranged to trip automatically when the voltage is off the supply circuit, or when the speed reaches a maximum limit. Old rails are used as resistance and the speed of the motors can be changed about 25 per cent by shunt field control.

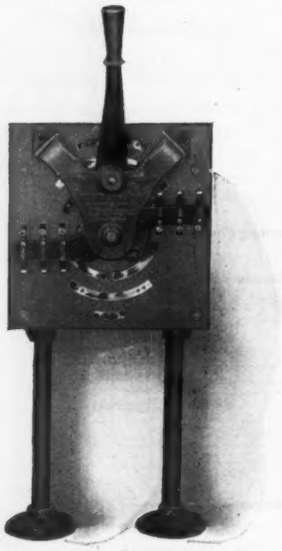


FIG. 11—MASTER SWITCH.

Multi-Speed Motors.

Multi-speed motors are used in installations where two or more different constant speeds are required. When direct-current is used, different speeds are obtained by using different field currents. With alternating-current, different speed induction motors mounted upon the same shaft are generally used, although recourse may be had to cascade connections; another plan is to provide the motor with one or more windings which can be grouped to give different speeds and may be employed when constant torque is not required over a wide range of speed.

Installation at the Illinois Steel Works.

This 30-inch plate mill is driven by two 2,000-horsepower, 575-volt (normal rating), direct-current, shunt-wound motors mounted on a common shaft. The speed varies from 0 to 150 revolutions per minute. The mill should be capable of reversing every four to six seconds. Good commutation is secured at low voltages and heavy currents by the use of commutating poles and compensating coils wound in slots in the pole faces. The power taken from the generating station is approximately 30 per cent of the maximum power used by the mill motor.

The torque required for starting and the energy required for accelerating these sets will be high and must be considered in making up designs. If the steel company buys power, such a system would surely be required by the selling company in order to protect its lines from the effects of these greatly fluctuating loads. The importance of equalizing the loads can be seen from Figs. 4 and 5. The main roll motor, Fig. 4, should have a capacity of 4,000 horsepower, while the motor of the equalizer and other apparatus back of it—transmission line, switchboard, generator, engines, boilers, etc.—need only be large enough to supply a 1,400-horsepower motor; the average power in Fig. 5 is about one-third the maximum.

Edgar Thomson Steel Works.

Fig. 14 shows the plan of an electrically-driven continuous rail mill at the Edgar Thomson plant, for re-rolling 50 to 90-pound rails or billets down to 20-pound rails or smaller. The mill consists of two trains of rolls, each driven by a 1,500-horsepower, direct-current, 220-volt, 125 revolutions per minute, compound-wound motor. The auxiliary equipment requires about 15 electric motors for operating such machines as hot saws, straightening presses, drills and cooling tables.

The Gary plant of the U. S. Steel Co. is a remarkable example of elec-

FIG. 12—RHEOSTATIC CONTROLLER (WITH CASE REMOVED).

tric drive. All the electric power is obtained from generators driven by blast-furnace gas engines, there being only a few steam engines for driving pumps and starting the furnaces. The principal reason for the use of gas engines is that they will produce about 2½ times as much power as could be obtained from the same quantity of gas if used for firing steam boilers and operating steam engines. There is ample supply of this gas for all power and lighting purposes. The gas engines require about 125 cubic feet of gas per brake-horsepower-hour. The amount of gas produced, for each ton of pig iron made, besides heating the air blast for furnaces and furnishing power for blowing engines, will furnish 25 brake-horsepower for general power purposes. A daily production of 1,800 tons of pig iron would therefore leave about 45,000 horsepower for the operation of other machinery. This company has now ordered electric motors for all auxiliary apparatus, 1,500-horsepower and 6,000-horsepower induction motors for some of the main rolls, and is considering still larger motors for other machinery.

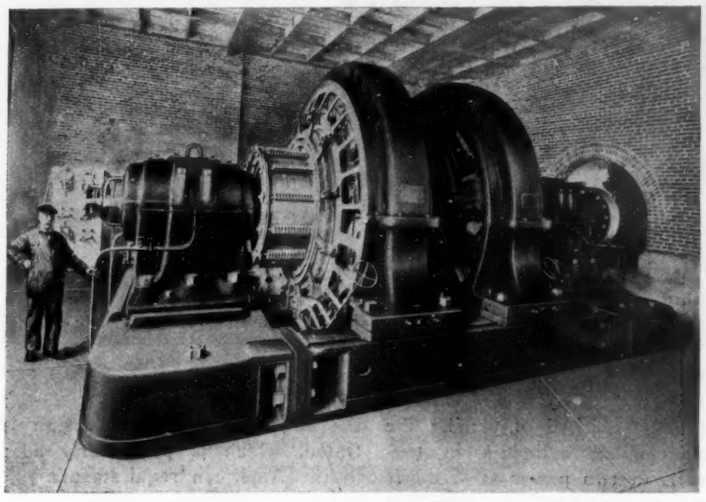


FIG. 13—REVERSIBLE MILL MOTOR SET DRIVING 30-INCH PLATE MILL.

In a short paper it is only possible to describe briefly a few installations; and while the generally successful operation of these plants, together with such considerations as reliability, ease of control, increase in output and reduced size of power house required, are conditions which seem to be quite favorable to the adoption of electric drive, it may not in all cases prove economical. Where mills do not have blast furnaces, water or other power, and where coal is fairly cheap, steam power may be more economical on account of the greatly increased cost of electric drive. When cheap power can be obtained from water falls or from blast furnace gas, electric drive has good chances of proving considerably the more economical, at the same time possessing the many advantages not peculiar to any other form of power.

[Editor's Note—The discussion on this paper was voluminous and interesting. Lack of space precludes its presentation in this issue, but it will be given substantially in full in THE IRON TRADE REVIEW of May 21.]

PERMANENT MOLDS DISCUSSED.

The monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club on the evening of May 8, when E. A. Custer, president of the Tacony Iron Co., gave an interesting illustrated talk on "The Making of Cast Iron Soil Pipe and Thin Flat Castings Containing 1.75 to 2.20 Per Cent Silicon and High in Carbon, in Permanent Molds." This process has been in operation at the Tacony plant since January, 1907, and was fully explained in THE IRON TRADE REVIEW of April 16. Many questions were asked by Alexander E. Outerbridge, President Thomas Devlin and others. Mr. Custer explained that the casting is made when the iron is at a very high temperature, and that it is removed from the mold after a few seconds. Specimens of the pipe made were shown, and it was stated that the process, which is patented, is a commercial success, and the pipes of great tensile strength.

There was some discussion of the anti-injunction bill now pending in congress, and a telegram of protest sent by Secretary Howard Evans was approved. These new members were elected: The John Wood Mfg. Co. of Coshohocken, maker of cast iron soil pipe; John H. Clay of Philadelphia, manufacturer of fire department supplies, represented by Geo. B. Clay, and the Debevoise-Anderson Co., dealer in pig iron, coal and coke. Attention was called to the annual convention of the American Foundrymen's Association to be held in Toronto next month, and it was urged that enough members attend to secure a special car.

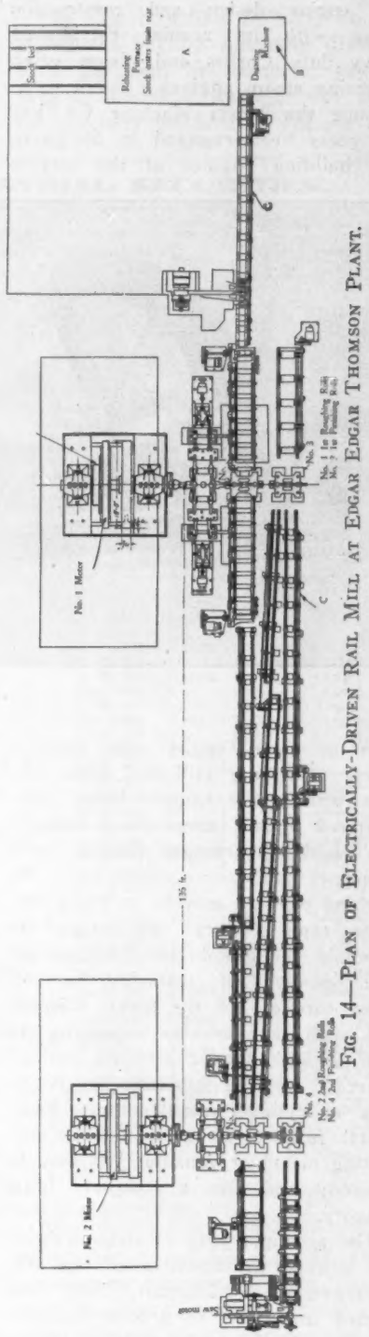


FIG. 14—PLAN OF ELECTRICALLY-DRIVEN RAIL MILL AT EDGAR EDGAR THOMSON PLANT.

THE MESTA GAS ENGINE.

The important position in the power field now occupied by the modern heavy duty gas engine has received careful consideration by the Mesta Machine Co., and after several years of close observation of the various types developed both here and abroad, this company has actively taken up gas engine design and construction along with its regular established heavy duty Corliss and piston valve reversing steam engines.

Since the Mesta Machine Co. has for years been engaged in designing and building engines of the largest sizes to meet the exacting requirements of rolling mill and blast furnace work, these engines being characterized by an exceptionally massive and rigid construction coupled with simplicity and accessibility of the working parts, it may be assumed that these same features of design are found in the gas engine construction. The question of materials is well taken care of, for the plant is equipped with air furnaces supplying an iron of high tensile strength and of superior wearing qualities so necessary in cylinder construction; open-hearth furnaces for steel castings containing nickel or vanadium, as may be desired; and also a complete brass foundry.

The accompanying illustration shows the general arrangement of the 600-horsepower, 400-kilowatt, direct-connected unit now in process of construction in the works at West Homestead, and typifies the series of sizes called for in the designs as at present laid down. In this engine are embodied the best features of both European and American designs, and, in addition, improvements which tend toward more economical and successful operation under the exacting conditions of widely fluctuating load which are so frequently met in American practice.

While natural gas as a source of power is at present an attractive proposition, it has been kept in mind that producer gas will eventually supplant it, and accordingly, careful attention has been given to the development of a design suitable to the use of producer, blast furnace, or other by-product gases.

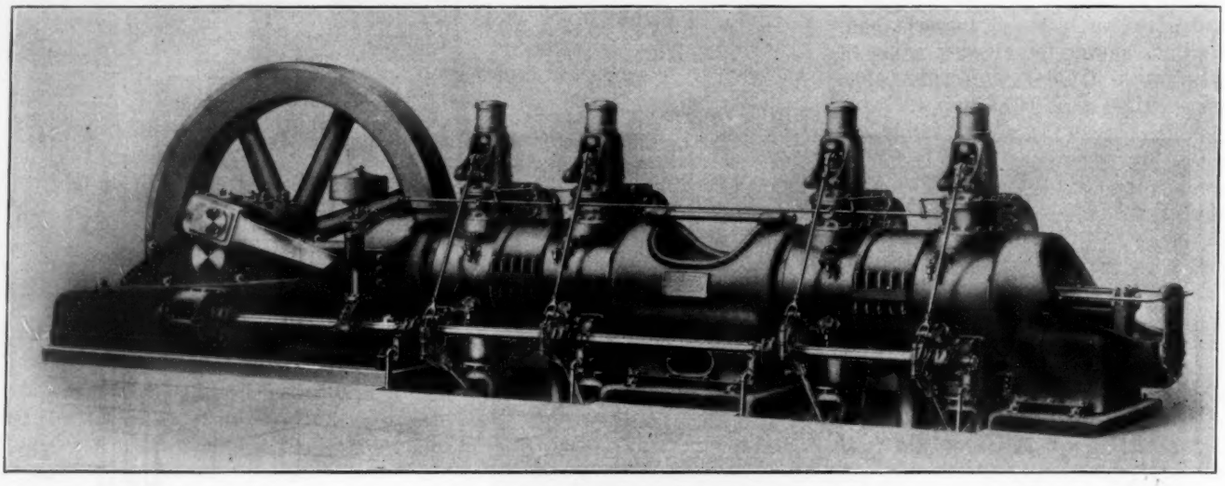
These engines, which are designed for operation on the four-cycle principle, are built either tandem or twin tandem. This method of placing the two double-acting cylinders in tandem results in two power strokes per revolution, giving close regulation and making it perfectly feasible to operate 60-cycle generators in parallel without the use of any form of flexible coupling. Where the twin tandem type is employed, the power strokes are doubled, and results in the same effective torque as in a cross compound steam engine.

The design throughout is characterized by massive construction, well suited to the demands of the most severe operating conditions; but in obtaining this necessary strength, the matter of accessibility and simplicity has not been lost sight of.

Following the American custom, the overhung crank construction is used, and owing to the tandem arrangement, careful attention has been given to the matter of longitudinal expansion, the cylinders being permitted to expand or contract with the varying temperature, while in no way affecting the engine alignment.

Simplicity and reliability are attained in the valve gear by first doing away with the spiral gear drive for the lay shaft, and, secondly, by operating both inlet and exhaust valves from a single eccentric. All parts subject to wear are fitted with adjustable devices of proved effectiveness, the aim being to produce an engine well suited to the demands of 24-hour service.

For the development of this line of engines, ranging in capacity from 500 boiler horsepower to 4,000 boiler horsepower, the Mesta Machine Co. has secured the services of Frederick Ottesen, who has had wide European and American experience in gas engine design, and has spent over a year in the development of the design illustrated, which is particularly adapted to the American requirements.



MESTA DOUBLE-ACTING GAS ENGINE.

Duty on Round Steel Wire.—Round steel wire imported by John A. Roebling's Sons Co. has been held dutiable by the board of United States general appraisers at 40 per cent and not at 2 cents per pound as assessed. The board followed a decision made in 1898 by former General Appraiser Wilkinson. The interpretation of the statute was that wire valued over 4 cents per pound and smaller than number 16 wire gage was dutiable at 40 per cent; but if valued at less than 4 cents per pound the proper duty was 2 cents per pound.

Since the United States Steel Corporation has obtained large shipments of manganese ore from India, and is acquiring large manganese properties there, the expansion of manganese ore mining in India has been rapid. While only 14,587 tons were shipped through the Kidderpore docks in 1906, shipments up to the end of October, 1907, amounted to 40,349 tons.

Market Tends Steadily Upward

The market was irregular throughout the week, but closed strong. The favorable crop outlook, despite a slight falling off from government figures for April 1, and the proposition to advance railroad rates figured somewhat as supporting factors. The general tendency of the market was upward. The rumor on Monday that the Union Pacific stockholders would authorize an issue of $100,000,000 in bonds, caused weakness, followed by prompt recovery the next day when explanation was made that but half the issue would be put out at this time. United States Steel preferred sold Tuesday at the highest price for a year. The reported railway advance in commodity rates together with sales of railroad supplies lifted the various railway supply company stocks; Railway Steel Spring preferred, 5 points, New York Air Brake, 3⅝; American Locomotive, 4⅜, and the preferred, 2¾; Westinghouse Air Brake, 1. On the other hand, Westinghouse Electric broke 4½ on an unfavorable reorganization rumor which was not verified. The market continued to advance, until on Friday, the stocks reached the highest average prices of the year, despite continued warnings from conservative bankers who declare that the market is going ahead too quickly and who say there is little tangible reason for the extraordinary advances at this time. Government deposits amounting to $20,000,000 were returned in answer to the call from the secretary of the treasury, and $20,000,000 more will be returned in two weeks, but the money market continues favorable, time loan rates being reduced ¼ per cent, and call loans ruling easy at 1½ to 2 per cent. New York City sold a total of $37,000,000 additional revenue bonds on practically a 3½ per cent basis without trouble. There was active demand for bonds, and the declaration has been made that the market is more bare of stocks than at any time in years, owing to the vast amount of security absorption of the past three months. The bank statement was very favorable. In the report by the associated banks, the actual increase in loans was $3,765,800, and the increase in loans of the non-member institutions was $23,623,300. The actual gain in cash by the institutions was $10,500,000, and the surplus reserve of the associated banks was increased $1,530,575, making the total surplus reserve now $73,883,475, which is the largest for any corresponding week since 1894. Bank clearings for the week ending May 7, aggregated $2,777,711,000, 21 per cent over last week, and but 2.8 per cent under the corresponding week last year. The total number of shares dealt in during the week was 3,851,400, compared with 4,559,613 last week, and 3,320,400 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $26,062,000 compared with $19,949,000 last week, and $6,698,000 for the corresponding week last year. Business failures for the week ending May 7 aggregated 288, as against 282 last week, and 154 in the corresponding week of 1907.

New York.—Amalgamated Copper closed 62⅜, a net gain of 2⅛.

Boston.—Butte Coalition closed 22½, a net gain of ⅜; Calumet & Arizona closed 105, a net gain of 1½; Calumet & Hecla, unchanged at 660; North Butte Mining, 58⅞, a net gain of ¾; Quincy Mining, 82, a net gain of 1.

The American Ship Building Co. declared the regular quarterly dividend of 1 per cent on common, payable June 1; American Radiator Co., regular quarterly dividend of 1¾ per cent on preferred, payable May 15, and 1 per cent on common, payable June 30; the Columbus Chain Co., regular quarterly dividend of 1½ per cent on preferred, and the regular quarterly dividend on the common; Pressed Steel Car Co., regular quarterly dividend of 1¾ per cent on preferred, payable May 27; Niles-Bement-Pond Co., regular quarterly dividend of 1½ per cent on preferred, payable May 15.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. May 9	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	8⅝	+ ⅝	Sept. 3	19,820,000			
Allis-Chalmers pr	21⅞	+1		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	5⅛	+ ⅛	Feb. 3	41,233,300			
Am. Can pr	55	....		41,233,300	7 cum	1¾ Q.	April, 1903
Am. Car & Foundry	36¾	+1⅜	June 25	30,000,000		1 Q.	April, 1908
Am. Car & Fdy. pr	98	+1½		30,000,000	7 n. c.	1¾ Q.	April, 1908
American Loc.	51⅞	+4⅜	Oct. 20	25,000,000	5	1¼ Q.	May, 1903
American Loc. pr	102¾	+2¾		25,000,000	7 cum	1¾ Q.	April, 1908
American Ship	46¾	+5¾	Oct. 14	7,500,000	4	1¾	April, 1908
American Ship pr	96	+1		7,900,000	7 n. c	1¾ Q.	April, 1908
Am. Steel Foundries	6½	— ⅜	Oct. 6	15,810,000			
Am. Steel Foundries pr	32	— ⅛		17,240,000	6 cum	2½	Aug., 1904
Barney & Smith	50	....	June 2	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith pr	90	....		2,500,000	8 cum	2 Q.	Mar., 1908
Bethlehem Steel	15⅛	+1⅛	April 7	14,862,000			
Bethlehem Steel pr	40	+4		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	30¼	+ ⅛	March 17	45,000,000*	6	1½ S. A.	Feb., 1903
Cambria Iron	46	....		8,168,000*	4	2 S. A.	April, 1908
Chicago Pneumatic Tool	23	....	Feb. 17	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	27¾	+3⅛	Oct. 19	34,235,500		3½	April, 1902
Crucible Steel	5½	+ ¼	Oct. 21	24,578,400			
Crucible Steel pr	39	+ ¼		24,436,500	7 cum	1 Q.	Dec., 1907
Empire Steel	8	....	Feb. 26	1,254,770			
Empire Steel pr	40	....		2,500,000	6 cum	3 S. A.	Jan., 1907
Fay & Egan	100	....	Feb. 18	1,000,000	6	1½ Q.	July, 1907
Fay & Egan pr	110	....		1,000,000	7 cum	1¾ Q.	Aug., 1907
General Electric	136⅞	+2⅜	May 12	65,167,400	8	2 Q.	April, 1908
Harbison-Walker	11	+ ¾	Jan. 20	18,000,000		½	Oct., 1907
Harbison-Walker pr	66	+1		9,600,000	6 cum	1½ Q.	April, 1908
International Pump	24⅜	....	June 2	17,787,300		1	April, 1905
International Pump pr	72	+1⅝		13,835,000	6 cum	1¾ Q.	Feb., 1908
Lackawanna Steel	32	....	March 11	34,971,400		....	....
Lake Sup. Corp	6	— 1⅛	Oct. 7	40,100,000			
New York Air Brake	70⅝	+2⅝	June 18	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	130	....	Feb. 5	8,500,000	6	1¾ Q.	Mar., 1908
Niles-Bement-Pond pr	100	....		2,000,000	6 cum	1½ Q.	Feb., 1908
Otis Elevator Co.	35	+1	March 16	6,156,600		1½ S. A.	April, 1908
Otis Elevator Co. pr	85	+1		5,449,500	6 n. c.	1½ Q.	April, 1908
Penn. Steel	60	....	May 11	10,770,000			
Penn. Steel pr	92¼	....		16,500,400	7 n. c.	3½ S. A.	Nov., 1907
Pittsburg Coal Co	11⅝	+ ¼	Feb. 10	28,853,400		....	Nov., 1906
Pittsburg Coal Co. pr	41	—1		27,080,800	7 c.	1¾	April, 1905
Pressed Steel Car	29	— ⅛	Feb. 19	12,500,000		3	Aug., 1904
Pressed Steel Car pr	84¾	+ ¼		12,500,000	7 n. c.	1¾ Q.	Feb., 1908
Pullman	159	....	Nov. 11	100,000,000	8	2 Q.	Feb., 1908
Railway Stl. Spring	34⅛	—1⅛	March 5	13,500,000	4	2 S. A.	April, 1908
Railway Stl. Spring pr	85	+5		13,500,000	7 cum	1¾ Q.	Mar., 1908
Rep. Iron & Steel	18½	+ ⅝	Oct. 21	27,191,000			
Rep. Iron & Steel pr	67¾	+ ⅜		20,416,900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	46¾	+1½	March 11	10,000,000	5	1¼ Q.	Mar., 1908
Sloss-Sheffield pr	92	+2¼		6,700,000	7 n. c.	1¾ Q.	April, 1908
U. S. Pipe & Fdy.	26	+1	June 24	12,500,000	4	1 Q.	Dec., 1907
U. S. Pipe & Fdy pr	74¾	+2¼		12,500,000	7 n. c.	1¾ Q.	Mar., 1908
U. S. Steel	36¾	+ ⅜	April 20	508,302,500	2 n. c.	½ Q.	Mar., 1908
U. S. Steel pr	101⅜	+ ⅛		360,281,100	7 cum	1¾ Q.	Feb., 1908
U. S. Steel 5's	96¼	+1⅝		463,798,000	5	5 A.	....
Va. Iron, Coal & Coke	48	—2	Nov. 17	9,073,680			
Westinghouse Elec	47	—4½	June 24	23,933,200*	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	99	+1	Oct. 6	11,000,000*		2½ Q.	April, 1908

Par value of shares, $100, except those starred (*), $50

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Acme Steel & Mfg. Co., Kansas City, Mo., has been chartered with a capital of $2,000, by C. C. Lacey, E. H. Zimmerman and Cyrus E. Sprague.

The Eclipse Metallic Specialty Co., Philadelphia, capitalized at $25,000, has these incorporators: H. Diflis, W. Weckesser, Philadelphia, and T. T. Jones, Colwyn, Pa.

Lintz Bros., Fort Branch, Ind., machine shop, have incorporated with a capital of $10,000. George F. Lintz, Henry J. Lintz and Mary Lintz are named as directors of the company.

The Southern Wisconsin Foundry Co., Madison, Wis., has filed articles of incorporation, with a capital of $25,000, through Henry A. Knabe, Herman M. Vance and Samuel G. Scanlon.

A charter has been granted to the New England Iron & Steel Corporation, Boston, capitalized at $3,000. Ida Rosenfield is president, and Morris Rosenfield, treasurer and clerk, both of Boston.

John Weichmann, Marie Weichmann and William W. Woollard, Albany, N. Y., have incorporated the Weichmann Turbine Tube Cleaner Co., to manufacture turbine tube cleaners, with $10,000 capital stock.

The Seaboard Engineering & Construction Co., Asbury Park, N. J., electrical and mechanical engineers, has been incorporated with a capital of $125,000 by W. W. Kurtz, A. J. Flynn, and F. F. Haberstick, Asbury Park.

Joseph W. Scott, Frederick H. Gansbergen, and S. Flanburg, Chicago, have chartered the American Iron & Wire Co., 1301 Chamber of Commerce building. The new company is capitalized at $50,000, and will do ornamental and architectural work.

P. F. Wood Boiler Works, Inc., New Bedford, Mass., boilers, etc., with a capital of $15,000, has filed articles of incorporation. The officers named are: President, Patrick F. Wood; treasurer, Charles Wood; clerk, William O. Wood, all of New Bedford, Mass.

The Gage Processing Co., Friendship, N. Y., to engage in processing iron, steel and other metals, has applied for a charter through Charles H. Gage, William H. Scott, Frank Hesmaudez, and Bemsley Williamson, all of Friendship, N. Y.

The Luzerne Foundry & Machine Co., New York City, foundry and machine shop, has been chartered with a capital of $100,000. The incorporators are F. W. Mills and A. M. Brown, 154 Nassau street; Charles F. Manning, 185 Nassau street, all of New York.

Articles of incorporation have been filed by the Atlas Steel Co., Dunkirk, N. Y., to manufacture iron and steel products, capitalized at $50,000. The directors of the company are Edward Burgess and C. Percy Burgess, of Dunkirk, N. Y., and Ray E. Dickinson, Titusville, Pa.

The Patterson Allen Engineering Co., New York City, to manufacture valves, machinery, etc., with a capital of $150,000, has been chartered by John H. Allen, 2 Rector street, New York; Franklin M. Patterson, Philadelphia, and Alexander B. Scully, of Chicago.

To conduct a general machine shop business and manufacture automobiles, etc., the Leader Mfg. Co., St. Louis, has been incorporated. Those interested in the business are Frank D. Gildersleeve, Augustus Ross, John E. Tackabury and Henry W. Allen. The capital stock, fully paid, is $150,000.

Frank F. Smith & Yates Mfg. Co., Newark, N. J., to manufacture locks, etc., with a capital of $10,000, has been incorporated by Frank F. Smith, 33 Second place, Newark, N. J., John W. Yates, 351 West Twenty-second street, and Edward A. Zink, 32 McCoombs place, both of New York City.

The Wielding Mfg. Co., Woodcliff, N. J., general engineers, etc., capitalized at $150,000, has filed articles of incorporation. The incorporators are: C. T. A. H. Wielding, Robert G. Wiencke, Woodcliff, N. J.; Frederick H. Carl, Wingfield, N. J., and William P. France, 1146 First avenue, New York City.

A charter has been granted to the Schultz Bronze Co., New York City, to manufacture metal goods, with a capital of $100,000. The incorporators are Louis F. Genet, 507 West 158th street; William K. Genet, 125 Wadsworth avenue; Harry de la Montagnie, 219 West 106th street, all of New York.

H. B. Kirkland Co., New York City, has been incorporated to manufacture electrical apparatus, machinery, etc., capital $20,000. The following, all of New York City, are among the incorporators: Francis E. Magle, 184 Eldridge street; Eugene Congletor, 187 West Ninety-sixth street, and Charles F. Boynton, 257 West 129th street.

The National Metal Spinning & Stamping Co, Brooklyn, N. Y., to manufacture metal stamping of all kinds, has filed articles of incorporation. The company is capitalized at $10,000, and has these incorporators: Samuel Tepfer, Harry Tepfer, 454 Hopkinson avenue, and George M. Tepfer, 1412 Pitkin avenue, all of Brooklyn.

The Steel Equipment Co., 1212 Ashland block, Chicago, has been incorporated to do general manufacturing, with a capital of $3,000. The incorporators are: J. E. Bales, D. I. Jarrett and Sarah Brennan.

The Southern Wisconsin Foundry Co., Madison, Wis., with a capital stock of $25,000, has these incorporators: Henry A. Knabe, H. M. Vance and S. G. Scanlon.

New Construction:—

J. H. Kelly, proprietor of the Kelly Machine Works, Mt. Gilead, O., has plans for making an addition to his plant 50 x 60 feet.

The Atlas Brass Co. has opened a general brass foundry at 991 South Front street, Columbus, O., to do a general brass casting business. John Wittman and I. H. Pleukharp are interested in the plant.

The Alabama & Georgia Iron Co., Cedartown, Ga., has completed improvements at the Cherokee blast furnaces. The improvements include the building of 10 charcoal ovens, and a storehouse for the fuel.

Stockholders of the Universal Tool Co., Springfield, Mass., are planning to locate the plant of the company at Turner's Falls, Mass., much of the company's stock having recently been subscribed for in the latter town.

The Minneapolis Steel & Machinery Co., whose plant was recently damaged by fire, has begun the work of repairing its structural shops. It will also erect a one-story brick addition 58 x 180 feet, at a cost of $12,000.

Charles and Henry Klar are letting contracts for the erection of a foundry at Canal Dover, O. The building will be of brick, two stories high, with a frontage of 80 feet. It is planned to do general foundry work at the plant.

The Saunders Corrugated Steel Culvert Co., has started work on the erection of a building at Cayuga, Ind., for the manufacture of corrugated steel culverts with a flat bottom and an egg-shaped top. Material and machinery have been ordered.

The contract for the erection of a warehouse for the Crucible Steel Co. of America, at 117 to 121 West Washington street, Chicago, has been let. It will be three stories, 60 x 151 feet, of brick and steel construction, with a concrete foundation, and will cost $50,000.

The work of rebuilding the burned portion of the machine shop building and the motive power offices of the Chicago & Alton, at Bloomington, Ill., will be begun as soon as the weather permits. The plans contemplate the re-establishment of the shops on the old site.

The Central Mfg. Co., Holland, Mich., manufacturer of plumbers' supplies, is rebuilding its plant recently damaged by fire, and will be in the market in a short time with its goods. The announcement is made that the structural part of the building was not damaged to a great extent, the fire being mostly in the finishing and shipping room.

The Glacier Metal Co., Richmond, Va., announces that it will shortly start the erection of a new plant in Manchester, across the James river from Richmond, Va., for the manufacture of its Glacier anti-friction metal (Babbitt metal). The works will be about 40 x 100 feet, two stories, with a capacity of 25,000 pounds of Babbitt metal per day.

The Kenton Iron & Steel Co. has completed its plant at South Charlestown, W. Va. The main building is 100 x 240 feet. Its machinery equipment has been removed from the former plant at Mason City . The work's equipment includes one furnace, four boilers, one 250-horsepower engine, a large pair of shears and a train of 10-inch rolls, etc. Flat, square and round bar iron will be the company's manufacture.

The Crompton & Knowles Loom Works, Worcester, Mass., has awarded contracts for enlarging its plant by the addition of three buildings, footing up $155,000. They will consist of an administration building and factory building combined, a machine shop. and a foundry building. A part of the present foundry building and the old stone mill of Gardner street will be torn down and a large part of the branch plant on Green street (the original Crompton Loom Works) will be moved into the new building. The administration and factory building will be 260 x 246 feet, of mill construction and five stories. The foundry building will be 225 by 225 feet with foundry one-story high and the supply rooms two stories. The machine shop will be 54 x 184 feet, four stories high.

General Industrial:—

The North & Judd Mfg. Co., New Britain, Conn., is increasing the capital stock from $200,000 to $500,000.

The Danville Stove & Mfg. Co., Danville, Pa., has filed an amendment to its charter, increasing its capital stock $145,000.

The Tiffin Malleable Iron & Chain Co., Tiffin, O., recently shipped five carloads of elevator material to Tiffin, Ont.

The Oscar Daniels Co., a New York corporation doing steel structural work, has taken out a charter to do business in Illinois, with offices at 79 Dearborn street, Chicago.

The Denver Rock Drill & Machinery Co., Denver, Colo., has leased the building formerly occupied by the Bogue Lead Co. The lead company has purchased a site for a new building in East Denver.

The Bennington Machine Works, Bennington, Vt., recently made a shipment of 42 tons of pulp grinding machinery to Mexico. This is the fourth order for this kind of machinery received by the company from the same country.

The site and building formerly owned by Davidson Bros. as a brass foundry, at Beloit, Wis., has been purchased by Slater & Marsden, who announce that they intend to move their South Beloit foundry to it and erect other buildings.

The Whitman & Barnes Mfg. Co., Chicago, Ill., announces that plans have not been formulated concerning the plant at St. Catherines, Ont., recently destroyed by fire. The company is awaiting the adjustment of its insurance.

The Faeth Iron Co., Kansas City, Mo., announces that the recent increase in capital stock was made for the purpose of providing additional capital for the increased volume of business as a merchant, the company not being a manufacturer.

The plant of the Southern Foundry & Machine Works, Fredericksburg, Va., was recently sold at public auction, a portion being purchased by James E. Tyler, executor of Charles E. Tyler, of Baltimore, for $7,950, and another building by Dr. S. T. Cassaday, for $1,800.

Taking advantage of the time when general trade is dull and construction costs lowered, the Waterbury Mfg. Co., Waterbury, Conn., is pulling down several old buildings and erecting new ones in their place. No changes are contemplated in the output of the company.

The Marinette Iron Mfg. Co., Marinette, Wis., made an assignment April 27 to M. Klauk, one of the stockholders. Difficult collections is given as the reason of the assignment, and it is said that the company will resume operations as soon as settlement is effected.

The Ryan Car Co., Chicago, Ill., has purchased from the Canal & Dock Co. the land upon which its buildings stand, containing 26½ acres, for $40,247. The property was formerly known as the Pease Locomotive Works. The company plans to enlarge its plant.

At the recent quarterly meeting of the directors of the Roane Iron Co., at Chattanooga, Tenn., they expressed the opinion of being well pleased with the condition of business, holding that the outlook in the iron business in the south is now much brighter than for several months.

The Wisconsin & Minnesota Bridge Co., Superior, Wis., whose incorporation was recently noted, is formed for the purpose of building a bridge across the St. Louis river between the states of Wisconsin and Minnesota. Because of the fact that the passage of an act of congress is essential, definite plans have not been made yet.

The annual meeting of the Northern Chief Iron Co. was held at Wausau, Wis., recently, and resulted in the election of the following officers. President, D. L. Plumer; vice president, Thomas Barden; secretary, W. C. Silverthorn, and treasurer, M. A. Hurley. The officers, with Captain McKay, constitute the board of directors.

By the death of one of the partners, March 13, it was found necessary to reorganize the Buffalo Galvanizing & Tinning Works, Buffalo, N. Y., which was originally organized as a copartnership eight years ago. The remaining partners have formed a stock company, whose incorporation was recently noted, and are holding the entire stock of the new company.

The Holland Launch & Engine Works, Holland, Mich., has gone out of business and empowered Attorney George E. Kollen to dispose of the plant, material, machinery, etc., to the highest bidder. The discontinuance of the business is due largely to a bad fire several months ago. The company was organized in January, 1907, with a capitalization of $10,000.

Frederick W. McKinney has purchased from Alfred L. Berry six acres

of land, including foundry and other buildings, extending from Thirty-fifth to Thirty-sixth street, and from Ashland avenue to the Chicago Junction belt line, Chicago, Ill. The buildings are occupied by the James A. Brady Foundry Co., the Charles Mulberry Mfg. Co., and the Adams Machine Co.

The Iszard-Warren Co., Inc., Philadelphia, which was recently incorporated, has now completed and equipped its plant and is manufacturing engineering instruments and carrying a complete line of engineering and drafting supplies. The company also manufactures the speedograph, a patented instrument for recording the speed and distance of travels of automobiles, railroad trains, etc.

The Estelle Iron Co., whose incorporation was recently noted, has been organized for the purpose of holding 25,000 acres of ore land near Estelle, Ga. President E. M. Jones says that the company has a tentative agreement with a steel company to lease the land, and it is expected that the agreement will be fully consummated in 30 or 60 days, but in any event, the Estelle Iron Co. will not become an operating concern.

The annual meeting of the stockholders of the Ironton Iron Co., Ironton, O., resulted in the re-election of the following directors: H. A. Marting, C. B. Fowler, A. Clark Lowry, O. T. Marting, A. H. Mittendorf, W. A. Murdock, F. L. McCauley, Charles Peters and D. C. Davies. The board re-elected the present officers, as follows: President, H. A. Marting; vice president, C. B. Fowler, and secretary and treasurer, Walter W. Marting. The officers reported that the new blast furnace stack is entirely completed and ready to be put in operation as soon as conditions in the iron market justify.

At the annual meeting of the Morse Twist Drill & Machine Co., held at New Bedford, Mass., the following officers were elected: Directors, Thomas M. Stetson, Gideon Alen Jr., Herbert E. Cushman, Thomas S. Hathaway, Edward Pierce and Russell Grinnell; treasurer, Herbert Cushman; and clerk, Thomas S. Hathaway. The treasurer's report showed a surplus of $121,956; profit and loss, $196,009. During the year $162,000 was paid in dividends, and there is about $4,000 of the profits remaining over.

The Cleveland Cap Screw Co., Cleveland, O., maker of special and regular bolts, screws, turn bolts, steel coupling bolts, gas engine valve stems, cam shafts, etc., has been reincorporated as the Electric Welding Products Co. This change of name more fittingly covers the development of the company's business from screws and bolts alone to various other electrically welded products also.

The Griffin Double Tread Car Wheel Co., Binghamton, N. Y., recently incorporated, will make a car wheel which, it is said, will double the life of the wheel now in use. This will result from the second tread which is to be added to the wheel. The brake, instead of operating on the tread which comes in contact with the rail, will operate on the second tread, which is the same shape and length, but does not touch the rail. This will prevent the breaking of the rail tread due to expansion and contraction from the friction of the brake.

The first stockholders' meeting of the American Mfg. Storage & Sales Co., Wichita, Kans., held recently, resulted in the election of the following officers and directors: President, I. S. Woodward; vice president, W. A. Rutledge; treasurer, G. L. Edwards, and secretary, Arthur P. Cutter; W. Dell Turner, J. M. Garrett, D. S. Shelly, George H. Wire and A. H. Webb. The company is capitalized at $150,000, and plans to do a general machine shop and foundry business, and carry on a storage, forwarding and transportation business for manufacturers. The company has absorbed the plant and running business of the Wichita Mfg. Co.

George E. Leonard has been appointed receiver for the Hendrick Hudson Iron & Steel Works, 509 West Fifty-sixth street, New York, on petition of three creditors. Neither assets or liabilities are large. The business was started in January, 1904, and was succeeded by an incorporated company about eight months ago. Its capitalization was $25,000.

The Connecticut Mill Supply Co., Torrington, Conn., has leased a factory there which is being equipped for the manufacture of steel rings used on spinning frames by cotton manufacturers. Heretofore the company's product has been by contract but from now on it will make its own rings. F. E. Norcross, formerly with the Draper Co., Hopedale, Mass., is secretary of the company and will become its business manager.

At the April meeting of the Crucible Club, held at Ironton, O., April 25, several papers were presented, among them a discussion of "The Odds and Ends of Blast Furnace Practice," by Phillip Hayward, chemist of the Hanging Rock Iron Co. O. P. Doty Jr., of the Detroit Furnace Co., and Harry Morris, of the Low Moor Iron Co., of Virginia, were elected members. H. L. Clay, of the Star Furnace Co., was chosen secretary-treasurer in place of D. F. Morgan, who has severed his connection with the Jackson Iron & Steel Co. to devote his attention to a large ranch at Plainview, Tex. The next meeting will be held at Portsmouth, O., May 30.

Resolutions indorsing the action of President Roosevelt in calling a conference for May 13, 14 and 15, to consider matters relative to the conservation of the natural resources of the United States, have been adopted by the board of direction of the Engineers' Society of Western Pennsylvania.

Trade Notes:—

DeHart & Stafford, jobbers in iron and steel, have moved to larger offices at their old address, 29 Broadway, New York City.

The New York offices of the Electric Controller & Supply Co., J. H. Hall New York representative, have been removed to Room 1563, Hudson Terminal, 50 Church street.

The Debevoise-Anderson Co., 95 Liberty street, New York, dealer in pig iron, coke and coal, has occupied more commodious offices in the same building, rooms 1107-8-9.

Fires:—

The plant of the Bellaire Stove Foundry, Bellaire, O., was damaged to the extent of about $1,800, May 1.

The engine room and pattern room of the Union Iron Works, Decatur, Ill., sustained about $6,000 damage by fire, April 25.

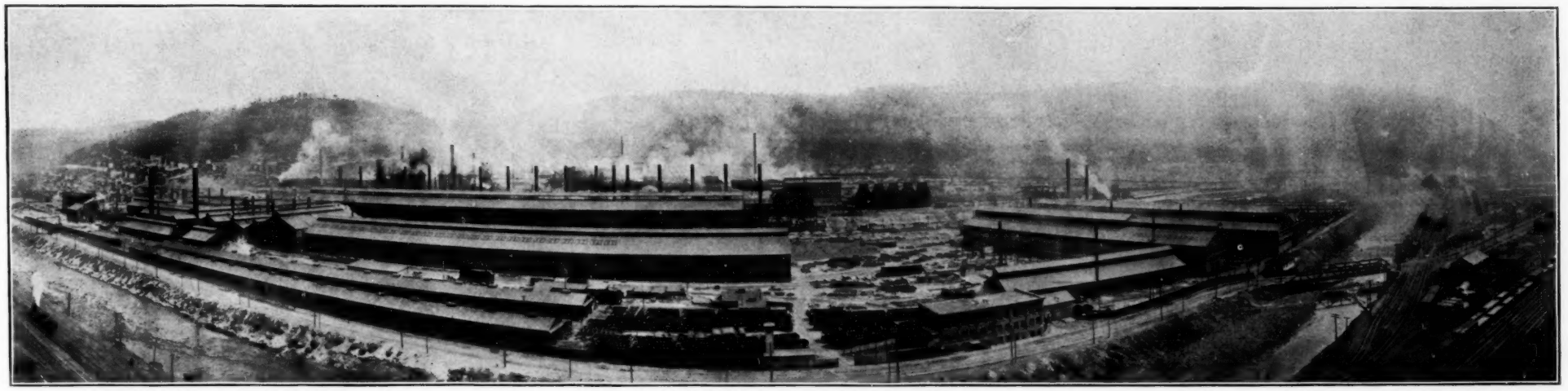
The Goeller Iron Works' construction building, Newark, N. J., was damaged May 4. The loss is about $11,000 and insurance $6,000.

TRADE PUBLICATIONS.

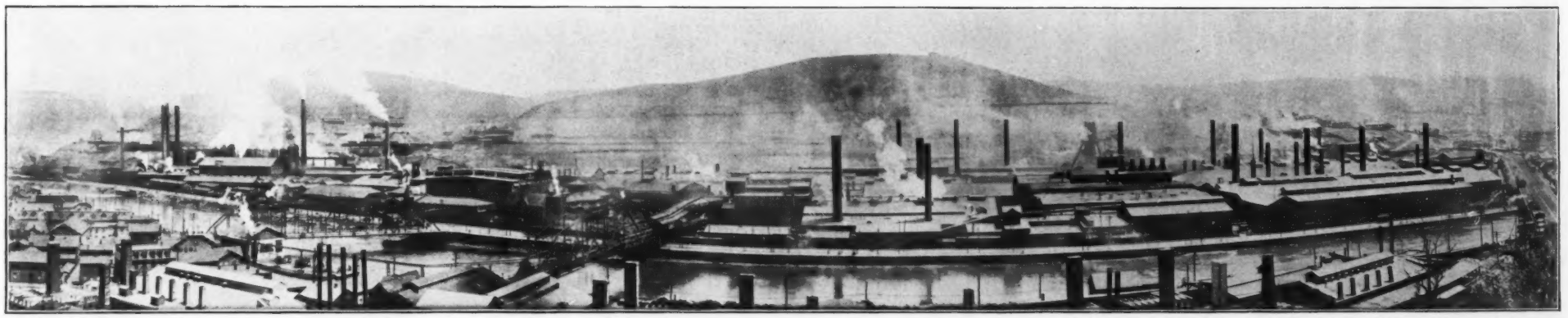
BELTING.—J. A. W. Bird & Co., 34 India street, Boston, have issued the first two of a series of technical books which they are now publishing, together with a computer for belting and shafting. Six booklets will be published in all during the year, the titles of the first two being Belt Drive Design and Power of Belting. The first one gives facts to be taken into consideration in the proper design of a belt drive, together with illustrations and examples. The second booklet presents rules and formulae for computing of power of belt drives. The two form a useful and convenient source of information on belting. The computer is of celluloid in the form of a slide rule and is designed for finding the speed, horsepower, thickness of belt, arc of contact, etc., for various belt drives. The series of booklets will be sent free to any one on request, while the computer will be forwarded by the company on receipt of six cents in stamps.

PLANTS OF THE CAMBRIA STEEL CO.

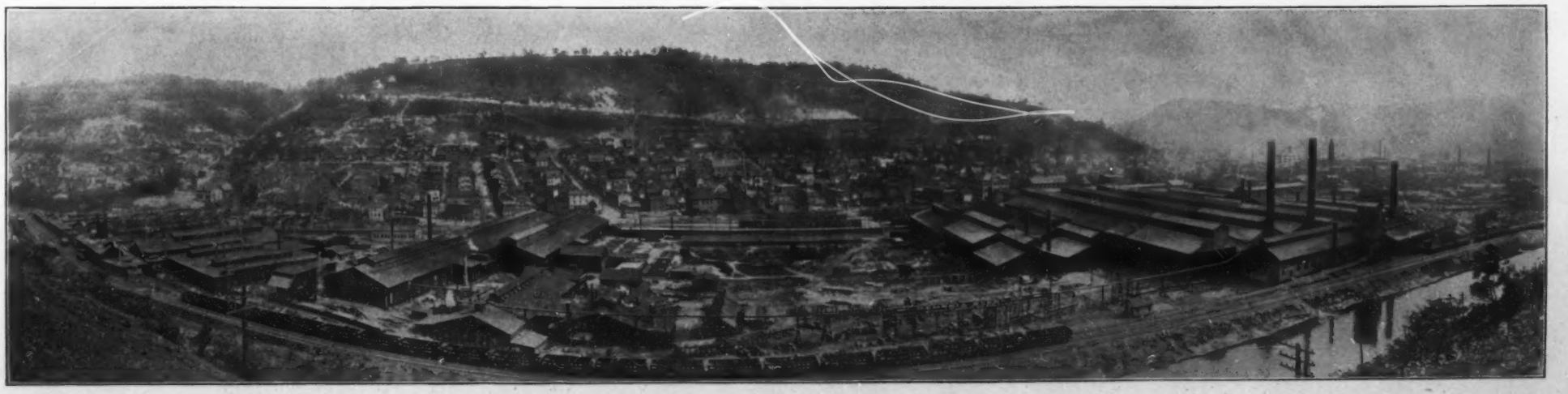
[See biographical sketch of Powell Stackhouse, page 885.]



FRANKLIN PLANT, JOHNSTOWN, PA.



CAMBRIA PLANT, JOHNSTOWN, PA.



GAUTIER PLANT, JOHNSTOWN, PA.